COAL AGE

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Your Help Needed

THE country is worried about the transportation crisis. Suddenly awakening to the fact that we are running behind, with no possibility in sight of production overtaking demand, the public has demanded of the Government action and relief.

Lack of coal is one of the principal causes of complaint. You as a producer of coal are not to blame for this condition, but that is no reason why you should not voluntarily assume your share of the job of putting things to rights. There is one way above all others in which you can help, and that is by selling your meager shipments of coal where in your judgment, based on the experience of the war, that coal is needed the most. To do this requires nerve, for contracts may appear to bind you, and to do this may mean foregoing some profits. You are interested in seeing normal and healthy conditions again, in having the railroads back on their feet, in being able to ship all the coal you can load. While your co-partners in distress—the railroads—are under such handicaps, ship your coal where it is needed to keep the country in food and transportation.

Remember that it was not until the members of the coal industry, individually and collectively, joined hands with the Government that even a start was made toward fulfillment of the program "Coal Will Win the War."

An Opportunity Not Yet Lost

SOME weeks ago we remarked that for its present status in regard to cost studies the Federal Trade Commission had but itself to blame. We still hold to that opinion. Mr. Reed, the able secretary of the National Coal Association, who is also pre-eminently qualified as a cost accountant, worked with the representatives of the Trade Commission in an effort to bring about harmony of ideas as to what shall be included in these self-same cost reports. On the one side was Mr. Reed, backed by the best thought and full experience of able, successful coal men; on the other the theoretical students of economics of the Trade Commission. They worked together to effect an agreement on this important problem. The Federal Trade Commission would not accede on basic points, and the test suit before Justice Bailey was the outcome and the answer of the Coal Association.

It is understood that the Trade Commission has met the desires of the anthracite operators, and that reports of costs of production will be forthcoming from that part of the industry.

If ever the bituminous industry needed the support afforded by cost figures from a Governmental source it is now. No fuel administrator stands sponsor for advancing prices, none but *ex parte* arguments and statistics are available to show the justification for higher prices in this period of unduly inflated costs.

The Trade Commission will try to get the reports from the bituminous operators, notwithstanding the adverse court decisions. The information is needed for the protection of the good name of the industry. Voluntary response to the call for monthly cost reports will show a real desire of the industry to lay its cards on the table.

Plight of the Postal Employees

NO greater argument exists against state socialism with its inevitable injustices than is afforded by the plight of the Post-Office employees. But one cannot wonder at their misfortunes, for no workingmen have been as shamefully neglected as those in the Government service. Government officials have repeatedly given vent to pious ejaculations about the rights of the workingmen to join unions, to make collective bargains, to demand wages proportional to the cost of living and to have not only a living wage but workmen's compensation. They have defended labor unrest with insinuations regarding the injustice of employers, men who were nevertheless paying relatively liberal wages.

But everywhere the bureaucracy has been the slowest of any to move in the adjustment of stipends. It has failed utterly to meet the needs of those who have faithfully served the state for years. It has been hidebound in opposition to a liberalization of its policies. While the cry has ever been to give more power to the Government and allow less to the people, there has been no clear sense of the obligation of the Government to those whose services it commands. The example of the Post Office Department warns us to what a degree the Government is likely to misuse its power. It should not be allowed to extend its industrial activities. Its functions should be solely of a regulative character and not those of a super-capitalist.

The Government service tends to draw to itself men of steady habits, men of a peculiarly accommodating mold. Most of them enter the Government employ with the intention of making it a life work. The postmen of the country are a body of men uniformly courteous in their behavior. They take their work seriously. Nowhere can more accommodation be found. Their cheerful courtesies do much to soften the asperities of life and to most of them the visiting from house to house with messages of cheer or sorrow has been a pleasure that has made them continue as postmen despite the inadequacy of their pay.

The wage of regular employees in the entrance grade is only 41½c. per hour, or $23.07 a week. The highest pay per week if there is no overtime is only $31.73. For carriers to attain this maximum salary frequently requires ten years of service inclusive of substitution and passage through the different grades. Under the law the shortest time is four years and to this must be added the inevitable period of substitution.

As proof that the letter carrier is not paid what he deserves it may be said that the Government has provided that 60c. per hour shall be paid to temporary employees. Men without qualifying experience get that larger sum, while relatively qualified men get 18½c. less. But 60c. per hour is found to be not enough. Postmaster Patten testified to the joint Commission on Postal Salaries that he found it difficult to get men at that figure. Strikers in other industries would accept employment from the Post Office Department while the strike lasted, but after it was over they would return to trades which paid more adequate wages. The substitutes that could be obtained at 60c per hour were found lacking in industry, efficiency and honesty and several had to be removed.

A commission has been appointed by both branches of Congress to investigate salaries. For fourteen months it has made no report and brought in no bill to alleviate conditions. Let every good citizen write to his Congressman and demand that justice be done to these public servants immediately. Do it, if not for justice at least of business expediency. The postal service is slow, it is undependable and it is getting worse. Its good men are going. Many have gone. The men that remain are soured. They are apt to carry a message of discontent from house to house. They have been 100 per cent Americans in the past. Their word was inspiriting and sympathetic. It will be an ill day when they and the school teachers cease to be "sold on America."

Scrapping Old Mine Cars

RARELY is a proper degree of courage shown in the scrapping of old mine cars. Seeing that the actual life of the older type of car is short it is hardly worth while to retain an old-type inefficient car in unwilling service. It is true cars may be shown which have had twenty or thirty years of active service, but if all the parts renewed during the previous five years were available almost a new car could be constructed. The sides become worn and broken, the bolt holes enlarge in the bottom, the bumpers break off, the whole car is racked and twisted, the wheels wear flat, the axles are bent and all parts have to be replaced. Badly wrecked cars are worth repairing only if they are up to date. Oftentimes enough wrecks to repay the cost of the change will be saved by ridding the mine of twisted, worn and broken cars.

In one of the articles this week a change of this sort is recorded, and some of the hundreds of rejected cars are shown in an illustration. Here, by the introduction of a new form of dump, the haulage system was freed of breakdowns, the roads were kept clean, repairs were cut to a minimum, dumping time and labor were decreased and a saving of some $12,000 a year is expected. Where the time of dumping had been eight minutes it was reduced to thirty seconds. The expenses of maintaining old equipment often far exceed the losses resulting from scrapping it, but as the losses in the one case are spread over some years of operation and do not openly appear on the cost sheet as "losses due to worn-out cars" while the costs arising from a change of equipment are obvious and immediate, the first form of sacrifice is preferred even though greater than the second. The secret losses from the use of obsolescent equipment are preferred to the smaller loss due to a radical discarding of antiquated material.

Mine Inspectors Will Meet in Cleveland

MINE inspectors of the United States and Canada will meet this year at Cleveland, Ohio, the occasion being the eleventh annual meeting of the institute. Since the organization of the institute at Indianapolis, in 1908, interest in these annual gatherings has grown steadily, with the result that every inspector in attendance has gone home from each meeting strengthened and renewed in spirit and better fitted for more efficient performance of his duties.

The membership now includes most of the strongest and more practical men engaged in the work of mine inspection, and the discussions of the many problems confronting them have been helpful and of benefit to all. In 1915, the scope of the organization was broadened to admit inspectors of metal mines, and this has been a source of instruction to those whose associations had previously been restricted to coal mining.

It is hoped that the coming meeting to be held at Cleveland, July 13, 14, 15, will draw together large delegations from every mining state. There are important questions that will be discussed, and every inspector should be on hand to gain the benefits of the views of his fellow inspectors.

Inspectors are urged to forward papers they desire to read, or subjects they wish to have discussed, to James W. Paul, secretary of the institute, Bureau of Mines, Pittsburgh, Pa., as early as possible. A cordial invitation is extended to all inspectors of mines, coal and metal, to be present, whether members of the institute or not; all will be welcome.

It is hope of *Coal Age* that the governor of every state will see that a good delegation of the mine inspectors of the state is sent to the Cleveland meeting, and adequate provision made for the expenses of the trip.

Shall We Have Priorities Again?

THE last resort in a desperate situation is priority orders. Surely there are enough veterans of the war in official Washington who, remembering the failure of this method of solving the transportation tie-up, will advise the administration of its futility as a remedy. Except as to causes, conditions today closely resemble those in January, 1918, when Garfield issued his famous five-day closing order. Factories now, as then, are closing through lack of fuel and raw materials and because of a lack of transportation to carry away finished products. Business is uneasy because new production must be financed at prohibitive rates of interest, or plants closed down.

The present situation is not the result of a shortage of cars and engines, but of men. What we are suffering from today is the accumulated effects of four weeks or more of the "outlaw" switchmen's strike. True, the roads need more equipment, but that which is available now would be, if in repair, scarcely less than that which carried the peak loads during the war. Freight is not moving today because railroad labor has no heart to move it.

Priority orders are but promises to pay—valueless unless the operating officials and the men below write their endorsements thereon. Will the public be satisfied with this sort of a remedy when it is realized that it produces not more transportation but better transportation for the few as against the many.

Rope-Haulage Methods and Equipment That Have Given Success at Lethbridge, Alta.

Anyone Can Install a Rope Haulage, but Most of Such Installations Receive in Process of Time Many Improvements in Detail—Here Are Some That Helped the Lethbridge Rope Haulage to Meet the Needs of the Colliery

By J. B. de Hart and J. H. Turner
Nacmine, Alta.

All mining men are familiar with the general principles of endless-rope haulage. There are numerous details, however, in connection with the operation of such haulage the importance of which is appreciated only by those who have come in close contact with such installations. Any mining engineer can install an endless-rope haulage that will operate, but it will be found in most cases that many necessary details have been overlooked and that improvement has to be made from time to time to materially assist in the movement of large quantities of coal.

Endless-rope haulage has now been used at Lethbridge Colliery, Coalhurst, Alta., for five years, and during that time many small changes have been made all of which aid in making the installation efficient. This article is not a treatise on endless rope haulage in general; it is merely a short paper showing drawings of such details of a haulage system of that character which experience has suggested and to which practice has given its seal of approval. Some of these can no doubt be used to advantage in other mines where endless-rope haulage is employed, while others will be found to be unnecessary where conditions are different.

The haulages described are not by any means permanent. As a matter of fact, they might be said to be makeshifts, as they are only temporary and when permanent engines are finally installed the existing machines will be moved further inbye, where they will act as feeders to the main haulages. Nevertheless, the mine has produced 29,706 tons of coal in one month hoisting ten hours per day for twenty-four days, or at an average rate of 1,238 tons of coal per ten-hour day. The maximum day's output handled by these haulages was 1,437 tons of coal and 113 cars of rock. It will be seen, therefore, that fairly large outputs can be handled by the haulage system even as it is at present.

Three haulages are used in the mine and these are marked on the plan shown in Fig. 1. Figs. 2, 3 and 4 show the profiles of the haulage roads for Nos. 1, 2 and 3 haulages respectively. The coal bed is intersected by numerous small faults whose throw varies from almost nothing to twenty feet. In many cases it can be seen from the profiles that the grading of the roads is not yet completed, only sufficient having been done to enable the haulages to work with reasonable efficiency.

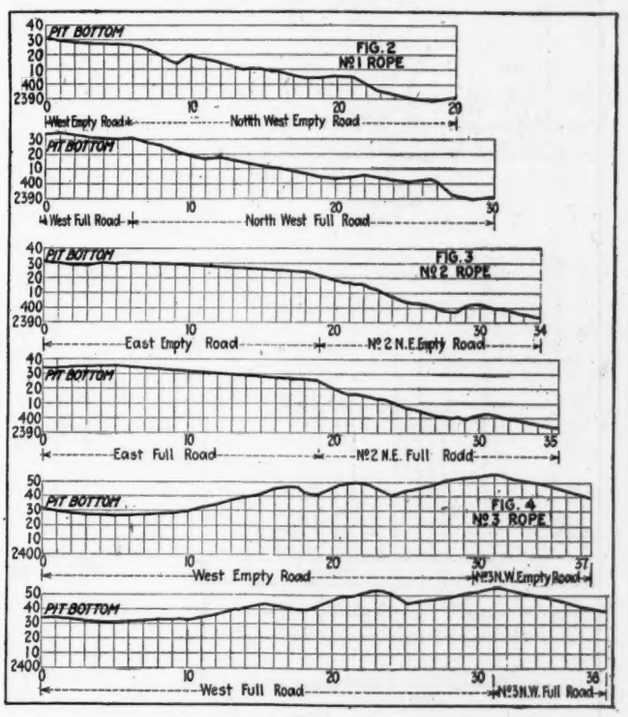
The roads are not as straight as they should be. Considerable straightening was done when the haulages were put in, but this work likewise is still incomplete. The roads were driven on sights, but when the mine was first started the economy of straight roads for rope haulage was apparently overlooked and the machinemen and miners at times were allowed to drive their places off the sights. All three haulages are similar. All are motor-driven and use ¾-in. Lang lay crucible cast-steel haulage ropes.

The No. 1 haulage machine was the first to be installed. The engine is shown in Fig. 5. It consists of a 25-hp. induction motor operating on 440 volts through gearing, shafting and a clutch. One countershaft and a No. 45 Hill clutch are used. The gear ratios are shown on the drawing; they give the fleet wheel a speed of 178 feet per minute. The details of the gearing and shafting are all shown in the figure.

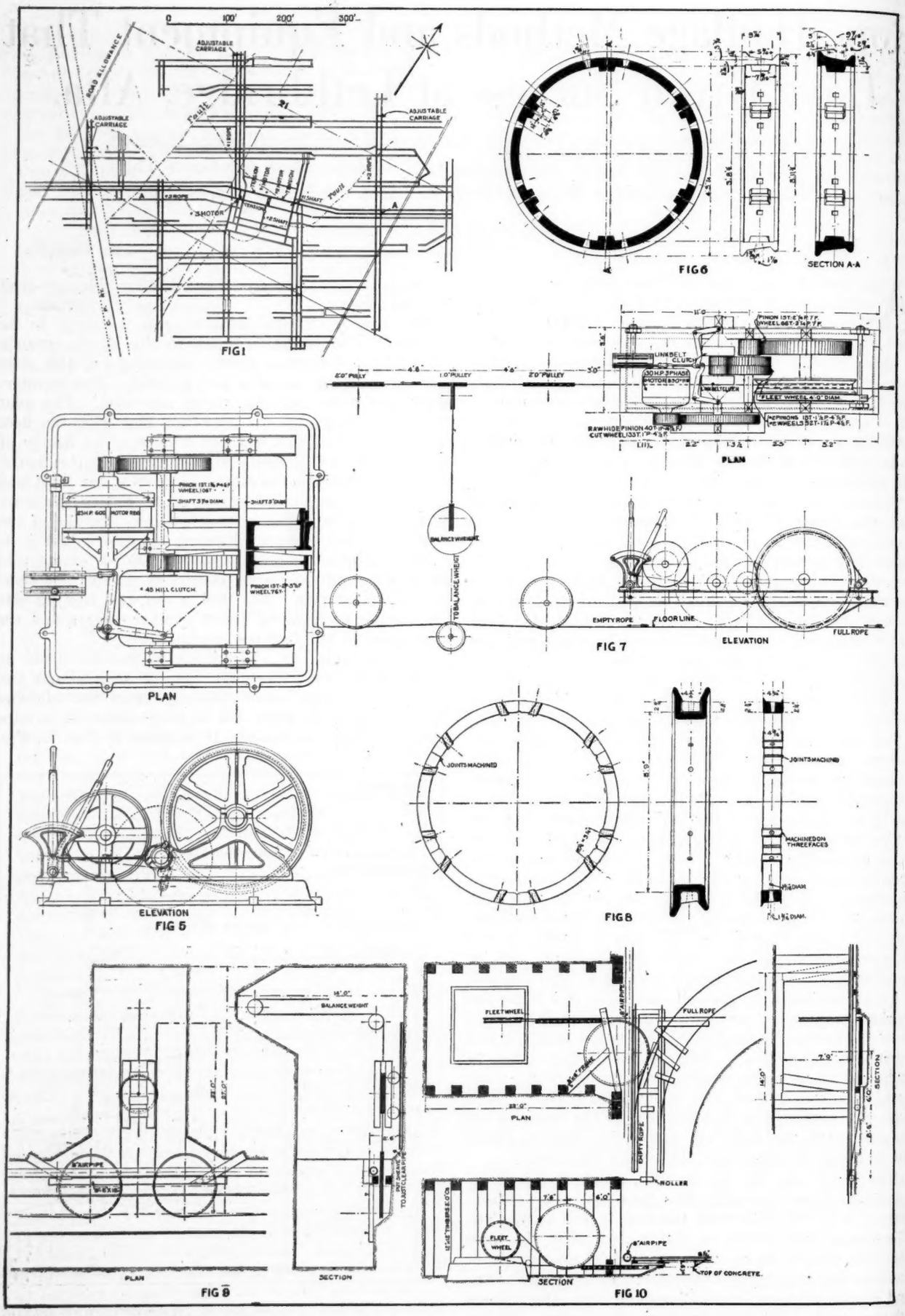
On this machine the second shaft was too light and a third bearing had to be put in to reduce the span. This bearing is shown in the drawing. Details of the fleet wheel and cast-steel lagging are shown in Fig. 6.

No. 2 machine is quite similar to No. 1, except that the countershaft was made heavier so that a third bearing is unnecessary. The fleet wheel and lagging also are similar to those of No. 1 haulage engine and the rope speed is 161 feet per minute.

No. 3 machine is a composite mechanism made up partly from one which was bought second-hand and partly from some spare shafting, gears and clutches formerly used to drive the picking tables at a mine now long since abandoned. It is shown in Fig. 7. Fig.



FIGS. 2, 3 AND 4. PROFILES OF THE EMPTY AND LOADED HAULAGE ROADS



FIGS. 1, 5, 6, 7, 8, 9 AND 10. LAYOUT OF HAULAGE ROADS TOGETHER WITH SOME MECHANICAL DETAILS

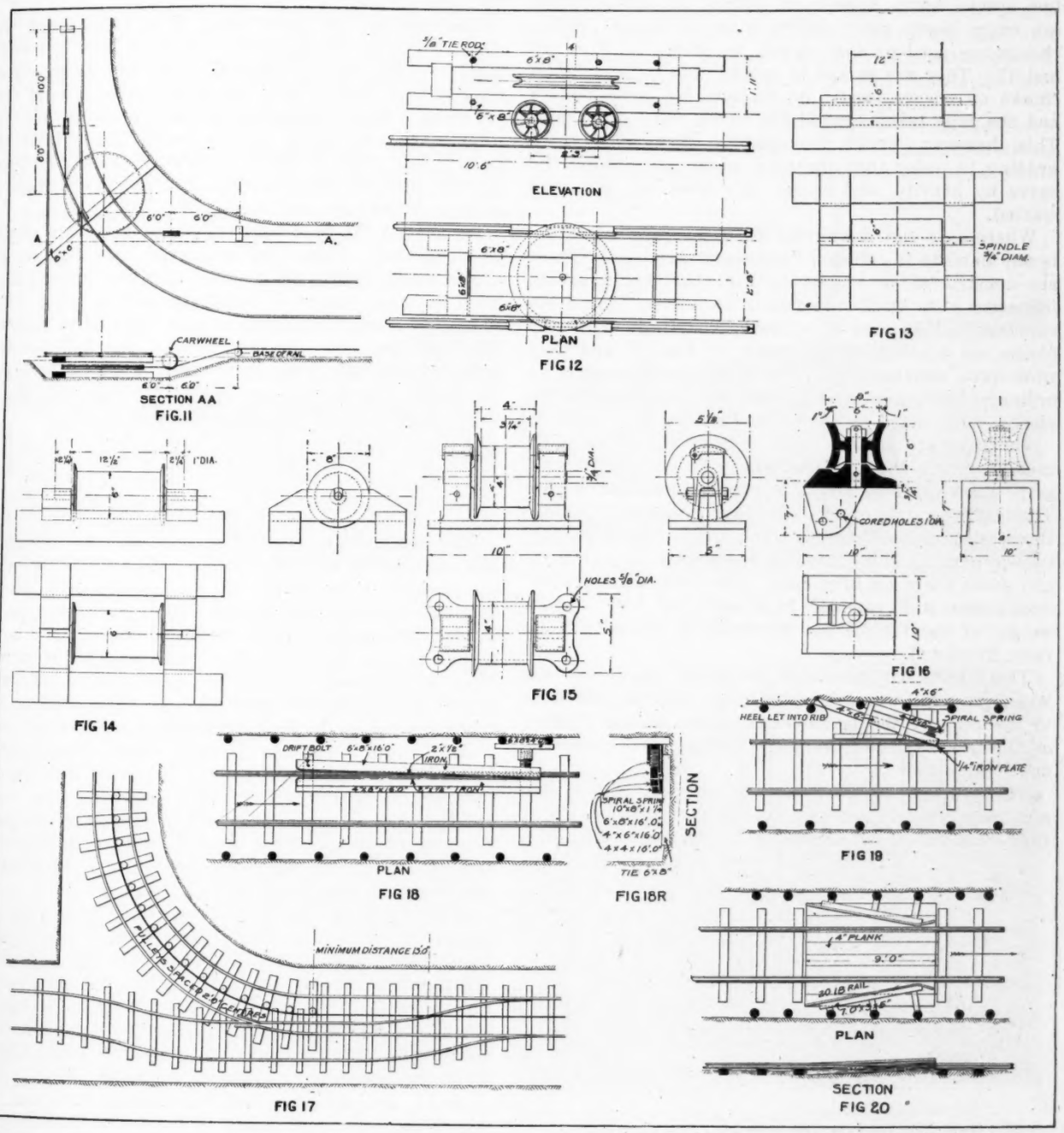
8 shows the fleet wheel and lagging. It will be noted that this is a different type of wheel with a different lagging from the others. It is constructed of cast iron and not of cast steel and is possibly more suitable to conditions in this part of the country in that new lagging when needed can be cast locally and does not require any machining. Details of the gearing are shown in Fig. 7. The rope speed is 177 feet per minute.

The engine houses are located as shown in Fig. 1, marked as No. 1 motor, No. 2 motor and No. 3 motor. Nos. 1 and 2 machines are located at the pit bottom and the two rooms are connected so that one man can attend to the two machines. No. 3 engine is located in a crosscut as shown.

The tensions for Nos. 1 and 2 ropes are on the empty rope near the engines as shown in Fig. 1. The arrangement of these tensions is shown in Fig. 9. The tension for No. 3 machine is placed immediately behind the machine—shown in Fig. 7. This is a better arrangement, where it is possible to get sufficient room, than the Nos. 1 and 2 tensions, as it is nearer to the machine and does not make necessary so sharp a bend in the rope. The total length of each rope in the different haulages is as follows: No. 1 haulage, 5,125 ft.; No. 2, 7,500 ft.; No. 3, 7,325 ft.

The arrangements of pulleys used at No. 1 engine house and where the loads come into the pit bottom are shown in Figs. 10 and 11 respectively.

At the inside end of each haulage is an adjustable carriage to take up the slack in the rope or to loosen it for splicing. The carriage works on rails—shown in Fig. 12. Rollers are used wherever necessary to keep the rope off the ground. Three types of rollers are employed. Wooden rollers, shown in Fig. 13, are



FIGS. 11 TO 20. DETAILS OF TENSION CARRIAGE, ROLLERS, RERAILERS, STOPS, GUIDE PULLEYS, SQUEEZERS, ETC.

mounted as shown. They are made by drilling prop ends and inserting the spindle and turning in a wood lathe till smooth. The size within reasonable limits is not material. Steel rollers, as shown in Fig. 14, are used in certain places and mounted in the same manner as the wooden rollers. A second type of steel roller used is shown in Fig. 15. By fitting up the bearings with babbitt these rollers can, where necessary, be employed also as holding-down pulleys.

These narrow rollers are used only in places, such as the pit bottom, where there is no possibility of the rope jumping the rollers. The wooden rollers are used where the rope rubs only lightly. In such places they are more efficient than the steel ones as they turn more easily. In many places a wooden roller will revolve where a steel one would stick.

Where the rope dips under the track at the pit bottom special heavy home-made rollers are used. These are extra heavy plain rollers with no flange. Bottle chocks are used on the curves, as shown in Figs. 16 and 17. They are spiked to special ties. These bottle chocks on curves should be replaced by large pulleys and the rope taken around the curve under the track. This, however, would necessitate a large amount of grading in order that the cars might run around the curve by gravity, and so far this work has not been started.

Where cars run downgrade onto the rope and there is any liability to collision "squeezers" are used. These are constructed as shown in Fig. 18. On upgrades numerous stop blocks are put in to prevent cars from running back in case of a broken coupling. The stop blocks are constructed as shown in Fig. 19 and they work quite satisfactorily. The spiral spring used is an ordinary furniture spring. Rerailers are installed in places, constructed as shown in Fig. 20.

The cars are run in trips, a Smallman grip being used to attach them to the rope. This is a cast-steel grip—shown in Fig. 21. A gripper goes with each trip. The maximum trip on No. 1 haulage consists of twenty-three cars, on No. 2 twenty cars, and on No. 3 haulage twenty cars up the grades to the points *A* in Fig. 1, and from there on fifty cars. The cars hold approximately one and one-half tons each and have a tare weight of about 1,500 lb. The track is laid with 20-lb. rails, fishplated.

The rope is not lubricated because it was found that when the rope was lubricated more damage was done to the rope by the tearing consequent on the slipping of the grips than occurred by natural wear when the rope was run dry.

The average life of a haulage rope is between two and three years. Some of the ropes last much longer than this but it is impossible to satisfactorily splice

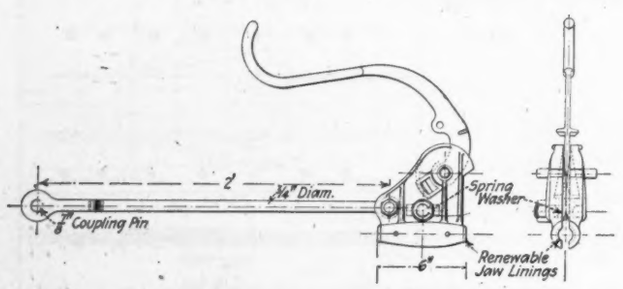


FIG. 21. DETAIL OF THE SMALLMAN GRIP
This device is employed to attach a car or trip to the rope

old rope to new and it therefore always pays to have an old rope on hand which has not been run to destruction and to use it for repairing the ropes in use. For instance, the last rope put on the No. 1 haulage was installed on July 19, 1915, and is still good for about another year. It will be run to destruction.

No. 2 haulage rope was put in place on June 13, 1916, and taken off May 24, 1918. It was in fair condition except for a number of bad spots. Two thousand three hundred feet of good rope was cut out of it to extend No. 3 rope and, the bad spots having been cut out, the rest is kept as a spare to use for repairing the ropes in service. No. 3 rope was put on March 4, 1917, and ran until Oct. 1, 1916. It was a poor rope and worn out. When all of No. 2 rope has been used for repair work another rope in fair condition will be replaced by a new one and the removed portion kept for repair work.

The cost of the three ropes above mentioned was about $4.50 per working day. This amount is accordingly charged against operations to the haulage-rope account each day so that the changing of a rope does not show a large charge against operation in any one month, the cost being spread evenly throughout the year. This figure—$4.50—naturally needs frequent revision because of increasing cost of rope, increasing lengths of haulages and the variable life of rope.

All around the rope roads two bare wires are strung on insulators. These are connected to a bell at the engine room, and by short circuiting the wires with a lamp or other piece of metal the bell is rung. The system of signals employed at this mine is as follows: One bell, stop rope for one minute; one bell followed of four bells, stop rope until starting signal is given. Four bells followed by two bells, start rope, this signal to be given by men who stopped rope.

TRIP SIGNALS WHEN STARTING

No. 1 rope	5 bells
No. 2 rope	5 bells
No. 3 rope	4 bells

The installation of such a haulage as has been described above can be accomplished without delay to the working of the mine. All the large pulleys, tension carriages and the like, engine and signal wires can be in place before the rope is installed. Rollers and bottle chocks can be put along the roads beside the tracks. It is only necessary to lead the rope around and splice it and the haulage is ready to run. The rope is best taken around by hauling the drum on skids (or on a truck if there is sufficient height) with horses, the rope unwinding as the drum moves forward. The rope is then spliced and while this is being done the bottle chocks can be put in place. The tension carriage is then lightened and the rope run so that it will come into line, when the rollers can be put in. More rollers can be added afterward.

It is best to set the wooden rollers off center so that when the rope has cut them nearly through they can be turned end for end. In this way their life is doubled. When an old rope is to be taken off it is cut close behind the engine and the end of the new rope is spliced to the end of the old rope. The engine is then started and the old rope wound on a drum as it comes off the fleet wheel while the new rope is unwound from its drum.

No. 2 haulage was installed over a week-end and where the cars were pulled by horses on Saturday the rope was operating on Monday.

Linn Mine-Car Dump Is Largest in the World

This Dump Is Nearly 300 Feet Long and Is Operated by Compressed Air—By This Machine Twenty-eight Cars in a Single Trip May Be Discharged Simultaneously — Old Bottom-Dump Cars Are Replaced by Cars with Solid Bottoms

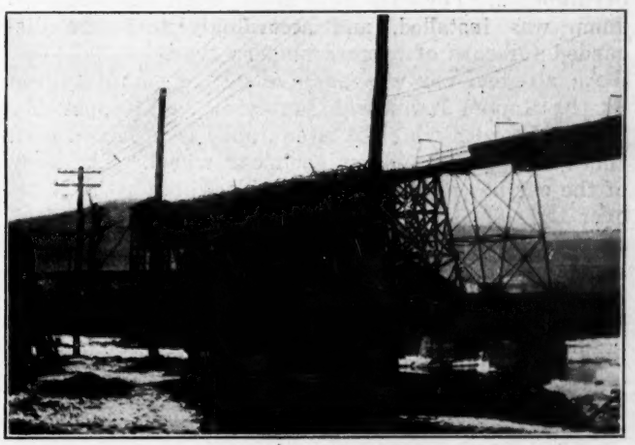
BY RALPH W. MAYER
California, Pa.

ALL THE coal produced by the Snowden Coke Co. at Linn, Pa., is made into coke at the mines. The charging larry runs along the top of the ovens and proceeds on a level track to a point directly under the bottom of the coal bin at the tipple.

This bin is nearly 300 ft. long and is of sufficient height to afford storage for the coal. The dump is installed upon the top of this bin and is supported by heavy steel I-beams extending across its top. This places the dump at a considerable elevation. It is reached by an incline, of such a length that the grade is slight. The dump is wired to accommodate a trolley locomotive.

The bin was built and used before the new method of dumping was introduced. In former days when a trip of cars was run over the bin, each car was dumped separately without being uncoupled, the cars being provided with bottom doors. To make this possible the bottom of the car was cut in two crosswise in a direction at right angles to the track, the two pieces being hinged along one edge. When open these pieces swung downward, allowing the coal to fall through the bottom of the car. They were held closed by a chain attached to the free side of the door and fastened to the side of the car. The axles passed through the inside of the car box and above the bottom doors, allowing them to swing freely.

This type of car had many faults. When the doors became worn they leaked and coal was scattered along the road, necessitating the employment of a small



FIGS. 1 AND 2. SIDE AND QUARTERING VIEWS OF THE DUMP AND SUPPORTING TRESTLE
The bin in which the coal is deposited extends the entire length of the dump, as may be seen. Twenty-eight cars can be discharged simultaneously. Coal from the bin is drawn by a charging larry and conveyed to the coke ovens.

FIG. 3. LOOKING INTO THE END OF THE DUMP
Note the stops attached to the circular supporting rails. They prevent the dump from rolling too far over

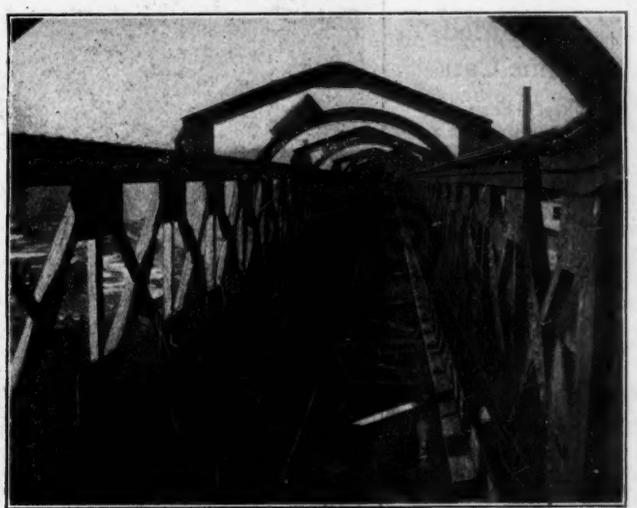


FIG. 4. VIEW STRAIGHT DOWN THE DUMP
Note upper and lower car-retaining angles which hold the cars when they are being dumped

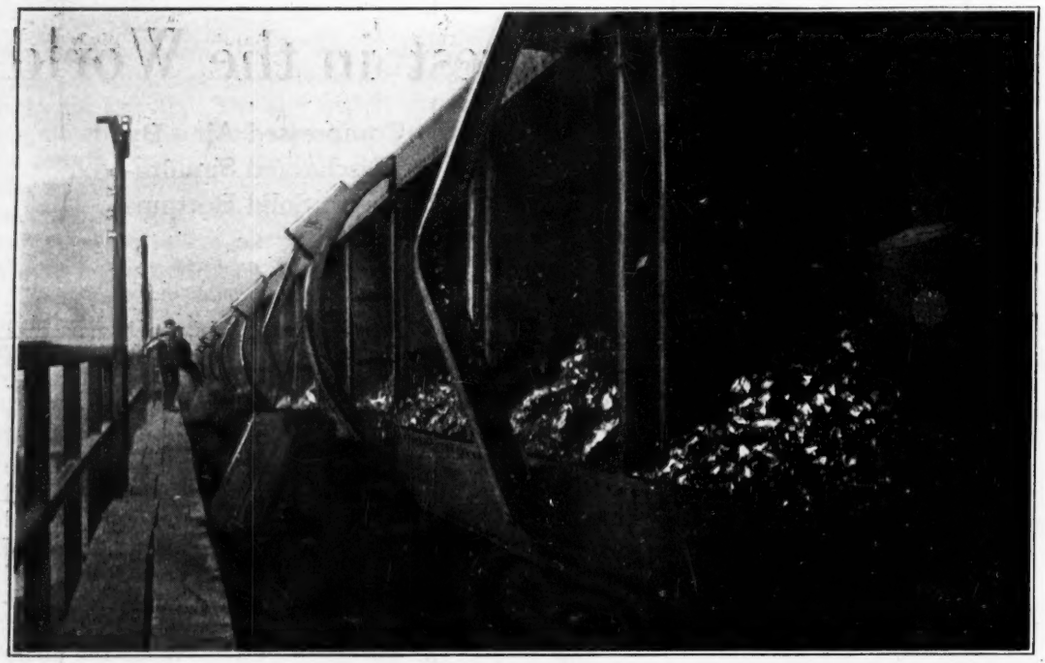


FIG. 5

Dump at the Half Turn

The cars, the ends of which look like vertical partitions in the dump, are held securely in place by the steel plate on the top of the mechanism. Most of the coal is already discharged.

army of men in cleaning up. Frequently the doors would come open accidentally and cause wrecks and derailments. The cars were about worn out when the dump was installed, and accordingly they are discarded for cars of a more modern type.

An all-steel car was adopted. It is manufactured by the Koppel Industrial Supply Co., of Koppel, Pa. The brake with which it is equipped is provided with shoes that press against each car wheel. The body of the car has an offset on the side which extends out over the wheels. All around the top of the car the sheet steel is bent outward for three inches and then bent down, forming a 3-inch flat edge around the car top.

An ordinary harness snap is used to hold the miners' checks. This snap is fastened to the center of the side of the car by a small bolt. When the car is dumped all the coal slides out on the side of the car opposite to that on which the snap is fastened.

The cars are coupled together by a single flat link and coupling pins. They have solid bodies, and each holds fifty bushels of coal. The cars are not weighed before dumping, as the miners are paid by the car and not by the ton, that being the custom throughout the Connellsville coke field. The machine men who cut the coal are paid by the number of working places which they cut. The drillers receive 17c. for each hole drilled. The men who shoot down the coal, or "blasters," as they are called, are paid by the day.

Car Dumper and Equipment

The coal is discharged by a pneumatic rotary dump made by the Car Dumper and Equipment Co., of Chicago, Ill. This holds twenty-eight of the cars (which are almost ten feet long over all) and dumps them all at one operation. It discharges the twenty-eight cars in eight seconds. The daily output of the mine is about six hundred cars. The dump is set at a slight in-

FIG. 6

Discarded Mine Cars

When these bottom-dump cars began to wear out it was decided that it did not pay to buy others of similar type or to rebuild them. The tracks were constantly covered with coal, wrecks were frequent and repairmen kept busy. The cars were hard to dump and as wasteful of coal as of labor.

clination so that the cars will run out of it by gravity. It is supported by ten rings made of track steel, which rest upon flanged wheels, the flange being placed on the downgrade side of the ring. Each ring rests upon two wheels, one on each side of the dump.

Four of the rings, at equal distances along the dump, are provided with narrow drums attached to their sides, around which several turns of cable are taken. This cable is firmly clamped to the drums, and an end passes down on each side of the dump, so that, by pulling on the proper cables, the dump can be made to revolve in either direction. The cables pass around sheaves, and from thence lead to a point near the middle of the dump. Here four cylinders are placed, two upon each side of the mechanism. These have long piston rods and are operated by compressed air. Each piston rod carries a sheave on its end.

Each piston may thus be made to exert a pull on two of the cables, the sheave around which the cables pass equalizing the pull on each. There are, as stated above, four cables on each side of the dump, and each piston pulls on the two which are on its side and nearest its end. The pistons are controlled by a two-way valve placed in the air line at the top of the dump. This valve will be later moved to the end of the dump, where its manipulation will be more convenient.

The movement of the pistons on one side of the dump pulls it over, that is, revolves it until the cars are discharged. When the pistons on the opposite side move they reverse the direction of rotation of the dump, again bringing it right side up. The mechanism is simplicity itself; there is nothing complicated or likely to get out of order. An air receiver is placed near the cylinders to insure a steady air pressure while operating the dump.

Lugs, or stops, are placed on the rings of the dump to arrest its rotation as soon as it has reached the right position. These are shod with wood blocks so as to prevent excessive jar. Whenever they become broomed on the end they can be replaced. The dump with a loaded trip in it can be revolved so gently that it would hardly break an egg when the stops strike the stop blocks. This is accomplished by properly manipulating the air valve, so that the cables on both sides of the dump exert the proper pull.

A square steel frame runs the entire length of the dump and is supported by the ten rings. The four corners of this frame are made from angle iron, whose sides are the same width as the wheel treads. Two bottom angles serve as the track upon which the car wheels run, their outside legs keeping the wheels from leaving the track. The two upper angles barely touch each side of the car at its top. One leg of the angle extends over the top of the car box, while the other lies along the side. These four angle irons thus hold the cars in place while the trip is being revolved and the cars emptied.

The four angle irons are firmly held in position by x-braced crosspieces. These are placed upon three sides of the steel frame, only the top being left open for the passage of the coal in dumping. The mine car comes into contact with the dump at only four points and is held in place by the L-shaped angle irons—two under the wheels and two along the sides and top of the car.

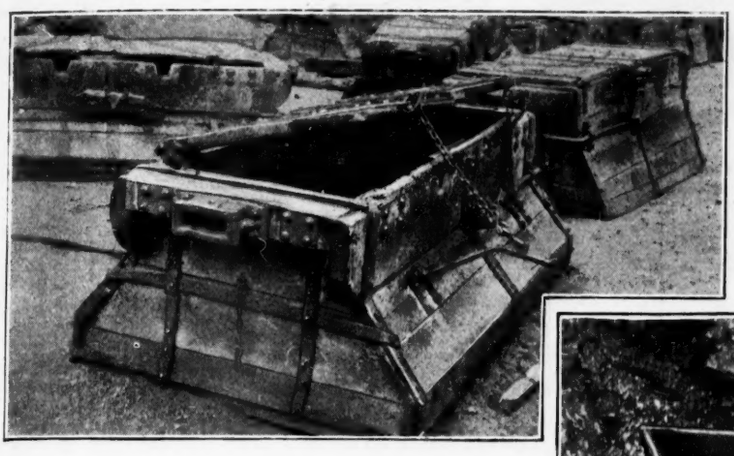


FIG. 7.

Mine Car Now Replaced

With no drawbar this car soon got "wabbly." Its two bottom gates leaked like the upper half of an hourglass and a force of men was kept busy gathering up coal that should never have been spilled.

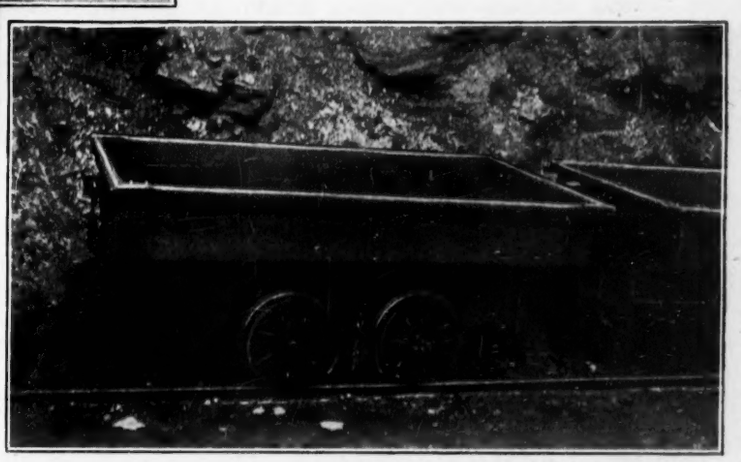


FIG. 8.

New Steel Sided Car

Without gates of any kind this car, with steel sides and wood bottom, spills no coal except when loaded over the car edge. It has no bottom doors to drop down and derail the trip and is much cheaper than the more complex bottom-dump car.

Rope From Hoist Passes Through Dump

An electric hoist is installed at the head of the incline to pull the cars out of the mine and its cable passes through the rotary dump. The mine is a drift operation, the coal pitching slightly away from the opening, which is at the end of a narrow valley down which a small stream flows. From the drift mouth the mine track is carried slightly up grade, along the side of this valley, until the end of the hill is reached. The track is carried from that point on a trestle to

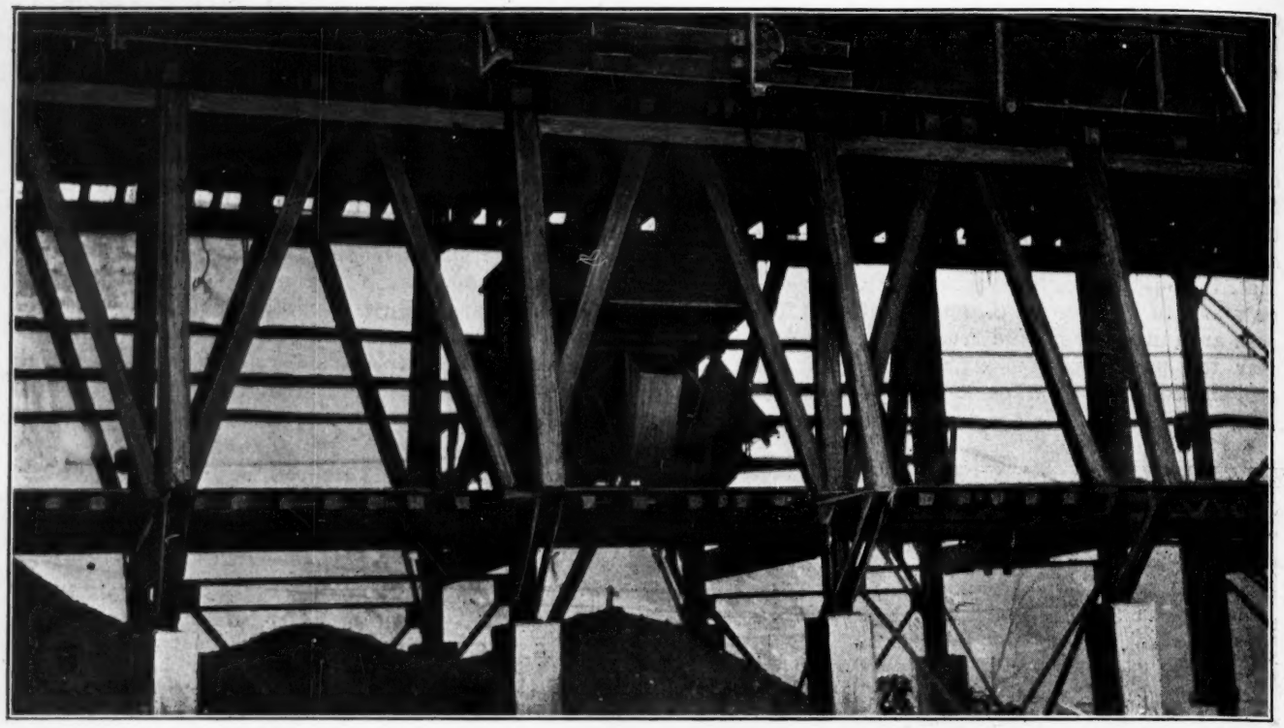


FIG. 10. COKE-OVEN LARRY FILLED BY THE LONG STORAGE BIN SUPPLIES COAL TO 265 OVENS

The bin shown was constructed many years ago. In order to keep it completely filled with coal when using the rotary dump it was necessary either to run the dump full length of the bin or to use a short dump with swivel connections on the mine cars and to provide machinery to carry the coal forward or back to the sections of the storage bin not provided with a rotary dump. Though the biggest dump heretofore built accommodated only eighteen cars, being located at the H. C. Frick Coke Co.'s mine at Lemont, Pa., it was decided to install at this mine a 28-car dump and so avoid swivel couplings, and a conveyor system.

the dump over the bins. At the town of Braznell the valley opens out into a wide flat, allowing plenty of room for the ovens and town.

E. H. Coxe, general manafer of the Snowden Coke Co., estimates that $9,000 will be saved annually through the prevention of wrecks, the saving of labor in the cleaning of the haulageway and in the repairing of cars, and from the greater amount of coal that can be handled per hour. Under the old arrangement, in dumping twenty-eight cars of coal into the storage bins the hoist engineer, the trip rider and an extra man had been employed in removing and replacing the pins that support the bottom gates of the cars. Now the trip rider can dump all cars without uncoupling them in less than thirty seconds. From records that have been made it has been found that more coal can be dumped in eight hours than was formerly dumped in ten.

From the saving in overtime caused by handling the trips in a shorter length of time it is believed by the general manager that $3,000 will be saved annually. This saving along with the other previously mentioned makes a total yearly saving of about $12,000. At this rate the installation will pay for itself in less than three years.

Operators, Railroad Men and Commission to Confer on Coal Handling at Tidewater

STEPS are being taken to arrange a conference between traffic officials of the railroads and representatives of the coal operators with members of the Interstate Commerce Commission to discuss rules for the handling of coal at tidewater. Coal consumers and operators are hopeful that an arrangement will be perfected to remedy present conditions that now exist at tidewater.

Do You Favor a Coal Exchange At Hampton Roads?

THE Wholesale Coal Trade Association of New York has addressed a letter of inquiry to the coal trade asking shippers to get together one way or the other in reaching a decision on the advisability of continuing or abolishing the Tidewater Coal Exchange at Norfolk. The letter follows:

"Those of our members who use Hampton Roads have been concerned about the likelihood of discontinuance of the Tidewater Coal Exchange at Norfolk, the report having gained circulation that the carriers, with the possible exception of the Chesapeake & Ohio Ry., were opposed to the continuance of the exchange. We are reliably informed to the contrary, and that the Norfolk & Western and the Virginian are really in favor of an exchange, with the limitation, however, that instead of being general, involving all three carriers, there shall be a pooling arrangement effected for each individual carrier.

"While this is not so desirable as a general pool, at the same time it is much better than having none at all.

"The missing factor, apparently, is a general expression from the shippers that they desire the arrangement to be continued. To supply this you are invited to address a letter to Charles S. Allen, secretary, stating tentatively your willingness to participate in the formation of an exchange, somewhat upon the lines of the Tidewater Coal Exchange, Inc., at the Northern ports, with the modification referred to above, upon receipt of which the same will be transmitted to the carriers with a view to perfecting the more necessary details."

Labor Held Blameless for Price Increases*

Coal Industry Held Up as Huge Profiteer, with Other Large Businesses, by Railroad Brotherhoods in Hearings Before the U. S. Railroad Labor Board—Increased Wages Held Not Responsible for High Cost of Living

A CAREFUL analysis of the data bearing on the causes of high prices and the relation of cost of production to prices leads to the following specific conclusions:

1. Profiteering—by which is meant the exaction of profits greatly in excess of pre-war profits on the part of producers, middlemen and retailers—is a fundamental cause of the high prices of practically all commodities.

2. Increased wages to labor are in no way responsible for increased prices.

To cite increased wages as a cause of increased prices is to betray an ignorance of the facts. Wage advances have been an *effect* of price advances, not a *cause*. An examination of the experience of every industry shows, practically without exception, that wage increases have lagged behind price increases and usually very far behind. In a period of rapidly rising cost of living it is inevitable that wages also rise in some measure, if the great body of wage earners, living as they do at best not far above the line of poverty, is not to suffer complete degradation.

But in no way has labor been the initial influence. Prices were pushed up by factors over which the workers had no control. They have merely struggled as best they could and in the only way they could to keep their old standards of living. In this struggle they have met with only very partial success. For the great body of wage earners wages have not kept step with prices.

As a result labor as a class is now worse off than it was before the war. Almost without exception a day's wage buys less than it did in 1912 to 1914. In other words, in the distribution of the income of the country labor is receiving a smaller proportion than it did before the war, while capital—in the form of profits, interests and rent—is receiving a very much larger proportion.

It is not contended that profiteering is the sole cause for the maintenance of prices at their present level. It is contended, however, and data are submitted in proof below, that profiteering has been responsible for a very large proportion of the price increases—probably one-half. Moreover, the other possible factors are more or less intangible and perhaps not susceptible to immediate remedy. But profiteering is a perfectly tangible thing, and one which can be remedied by intelligent statesmanship. And it is only by striking at this root cause of our present troubles that permanent remedy may be obtained.

It is not possible to compute the full extent of the profiteering that has taken place and is now taking place. The complete information is not available and probably never will be. Too many hands have dipped into the golden stream of war-time profits. Too many ways have been discovered by corporations and business men for concealing the full measure of their earnings. But, in spite of these difficulties, sufficient evidence does exist to establish a conclusive case of "profiteering"—of profiteering on a scale that makes one almost despair of the future of the country.

This summary from the report of Mr. Lauch is reprinted because it gives coal operators the opportunity to learn how they are being pictured to the public—by labor in particular—and also to make comparisons of the coal industry with various other businesses.

The evidence referred to is of an entirely authoritative character. It includes the financial statements of corporations, the Federal income tax returns, the investigations of Governmental bodies such as the Federal Trade Commission, the Tariff Commission and the Bureau of Foreign and Domestic Commerce, and various reports, studies and statements by other official agencies and men in close touch with public and business affairs.

Perhaps the most conclusive evidence of profiteering is contained in the financial reports of the corporations themselves. In order to develop this point a careful analysis has been made, for the years 1912 to 1918, inclusive, of the financial reports of all corporations of $1,000,000 annual income in certain lines of business in which the ordinary consumer is particularly interested. The sources used were the well-known financial manuals such as Moody's and Poor's.

The table on page 1090 summarizes the results of this study. It shows for a large number of corporations by industry groups the average annual net income and the per cent of net income to capital stock for the three pre-war years 1912-1914 in contrast with similar data for the three war years 1916-1918.

The outstanding fact in this table is simply stated. The corporations listed—including all with incomes of $1,000,000 or over in any one year in so far as they are listed in the financial manuals—earned during the years 1916-1918 an average income of nearly $1,250,000,000 a year, or nearly 24 per cent on their capital stock. This appears to be nearly three times the average for the pre-war years 1912-1914, and the figures for production, where these are available, show conclusively that these increased profits were not due to increased production. They were due in large measure to the fact that the corporation took a larger proportion of every dollar spent by a purchaser. This fact will be shown conclusively in another part of this study. Here it is sufficient to note that for the three years 1916-1918 the annual profits of these corporations averaged approximately $800,000,000 more per year than during the three-year period preceding the war, 1912-1914.

This is a startling fact. Basing our calculations upon the reported net corporation income as shown in the income tax returns these corporations represent about one-sixth of the total corporate income of the

*From report on "The Relation Between Wages and the Increased Cost of Living" presented to the U. S. Railroad Wage Board by W. Jett Lauch.

United States. If these other corporations did as well as those of which record is available, and there is reason to believe they did, then the combined corporations of the country earned approximately $4,800,000,000 more *per year* during the three war-years 1916-1918 than during the three pre-war years 1912-1914.

A total of $800,000,000 means $40 per family of five throughout the nation. A total of $4,800,000,000 means $240 per family of five throughout the nation. Consider that each family of five paid as a toll, not to so-called legitimate profits, but to excess of war profits over pre-war profits, $240 per year, and one gains an idea of the total burden which profiteering meant to the country. Yet it is a conservative estimate of what actually happened, and it must be remembered that this huge figure does not represent the whole profit but only the part in excess of the pre-war level.

Even such stupendous figures do not tell the whole story. For the most superficial investigations reveal the fact that during late years the companies have been resorting to numerous devices for concealing profits. Excessive deductions for depletion and depreciation reveal themselves very quickly when we turn to such basic industries as copper and coal. In other industries huge sums are found set aside for Federal Tax Reserves—sums out of all proportion to the necessities of the case.

In other words, there are very good grounds for concluding that the figures given above very much understate the real profits taken by corporations during the war years. An average of $1,200 per family of five during the years 1916-1918 is probably a highly conservative estimate of the actual cost of corporate profiteering to the consumer.

During the three years 1916-1918 the consumer has been paying the food corporations whose reports are available over two and one-half times as large profits as were considered acceptable before the war.

In the clothing group the increase in profits was proportionally even greater, the price of clothing carrying a charge for profits nearly three times the pre-war figure.

Turning to the corporations which produce various kinds of fuel, together with certain building products, we find the profits for the war years 1916-1918 nearly two and one-half times those for the pre-war years 1912-1914. For the three years 1916-1918 the average was nearly a quarter of a billion dollars a year. The accumulation of profits for the four years 1916-1919 undoubtedly totaled more than a billion dollars. This means that during the years mentioned these corporations earned, after every possible deduction had been made, enough to replace their entire capital stock.

The profits of the basic metal industries, however, outdistance those of any other group. These industries are the ones which produce commodities—such as iron, steel and copper—which the consumer never buys directly, goods which are bought by other intermediate producers. But the cost of these basic products enters into the price paid by the consumer.

The war, with its demand for munitions, greatly increased the opportunity to profiteer in these lines. As a result the industries whose services the nation needed most more than trebled their profits. The profits taken during the war years 1916-1918 were, in fact, nearly three and one-half times those taken during the years 1912-1914—$590,138,605 as opposed to $172,729,195. In other words, the excess war profits amounted to over $400,000,000, which eventually reached the consumer in the prices which he paid for the various commodities into which these basic metals entered.

For a corporation here and there to find itself in a strategic position which enabled it to make huge profits, there was precedent before the war. But for practically the entire business organization of the country, the

INCREASE IN NET INCOME AND PERCENTAGE EARNED ON CAPITAL STOCK OF CORPORATIONS IN SPECIFIED INDUSTRIES DURING THE PERIODS 1912-1914 AND 1916-1918 †

	No. of Companies	Capital Stock 1918	Average Annual Net Income for Period ¶ 1912-1914	1916-1918	Per Cent Net Income Is of Capital Stock for Period ‡ 1912-1914	1916-1918
Basic Metal Industries:						
Copper mining	14	$253,290,655	$46,557,451	$137,046,514	19.7	54.0
Miscellaneous mineral mining	6	182,764,263	17,571,427	27,998,792	7.7	13.6
Iron and steel works	19	1,384,433,855	74,649,117	334,888,406	6.1	26.9
R. R. equipment manufacturing	7	220,809,152	15,745,728	38,676,951	7.3	17.7
Metal products manufacturing	11	167,716,560	18,205,471	51,527,942	11.8	31.1
Totals	57	$2,209,014,485	$172,729,194	$590,138,605	8.4	28.2
Clothing:						
Textile manufacturing	8	$100,251,744	$3,734,215	$21,551,064	3.9	22.6
Clothing and dry goods	11	242,352,056	15,299,288	33,621,247	6.2	13.8
Totals	19	$342,603,800	$19,033,503	$55,172,311	5.8	15.8
Food:						
Packing houses	5	$172,477,050	$20,146,784	$58,644,468	14.4	36.9
Sugar producing and refining	12	179,257,338	11,306,923	34,174,794	6.5	19.1
Food products, miscellaneous	12	296,733,193	18,535,621	39,857,473	6.9	13.6
Totals	29	$648,467,581	$49,989,328	$132,676,735	8.6	21.3
Fuel, Light and Housing:						
Coal and coke production	32	$262,672,277	$16,098,691	$40,195,220	7.6	15.2
Petroleum products	22	478,758,480	73,989,006	178,779,091	18.7	39.8
Building material manufacturing	10	177,810,900	10,154,722	27,729,685	5.7	15.6
Total	64	$919,241,657	$100,242,419	$246,703,996	12.3	27.6
Miscellaneous:						
Mercantile establishments	7	$179,691,396	$22,790,700	$37,632,491	13.9	21.3
Agricultural supplies	7	316,005,600	22,901,434	37,895,558	7.4	12.1
Miscellaneous industries	22	757,183,933	50,976,849	134,139,992	7.1	17.9
Totals	36	$1,252,880,929	$96,668,983	$209,668,041	8.1	16.9
Grand Totals	205	$5,372,208,452	$438,663,427	$1,234,359,688	8.7	23.9

†Income of companies for which average for pre-war period was unobtainable eliminated in order to render totals comparable.

‡In computing these percentages, entries of net income and capital stock were omitted when both of these items were not given. This occurred in only a few cases. When issues of stock since 1912 are known to have been in the form of "stock dividends," such issues have been ignored on the basis that nothing was added to the property investment thereby.

¶In cases where income is reported for only one or two of the three years, either the amount for the one year or the average of the amounts for the two years has been treated as an average for the period.

sum total of the corporations, to be in such a strategic position that it could hold up the public for enormous profits upon everything, no precedent can be found.

After all expenses of operation and maintenance had been paid—after all charges for replacement of capital had been set aside—in fact, after every conceivable or imaginary expense had been met—these great groups of corporations, controlling the various products essential to our life, made profits which were sufficient to replace the entire value of the capital stock within a period of slightly over four years. This is proved by their own published reports.

Income Tax Returns Disclose Profiteering

Statistics compiled by the Commissioner of Internal Revenue from income tax returns show that the corporate profits of the companies listed in the financial manuals are representative of the whole tendency throughout the country's business. For the years 1912-1914 the average of net corporate income was approximately $4,268,000,000. For the years 1916-1917 it had increased to approximately nine and three-quarter billions of dollars. In other words, the net income for the war years was more than double that for the preceding years, despite an excessive deduction of $74,000,000,000 from gross income before net income was reached in 1917. Detailed data on this point will be found in a separate study. The significant fact is that in 1917 reported corporate income was over ten and one-half billion dollars.

As in the preceding analysis of the financial reports of corporations, so here it is found that the most extraordinary increase in profits during the war appeared in the industrial and mining group, where the corporate income returned for 1917 was approximately four times the pre-war average—$6,500,000,000 as contrasted with $1,669,012,000.

If from the figure given for the total net corporate income for 1917 we deduct the approximate value of the excess profits taxes, and further deduct 10 per cent on all additional capital invested to expand industry to meet war demands, the profits of corporations are still found to be over three and one-half billion dollars above the pre-war average.

Such enormous profits made at the expense of the consumer were too large to be divided all at once, especially when a large proportion of high incomes went to help the country carry the enormous expense of war. So only a part of the profits was disbursed. The remainder swelled reserves to huge proportions. Thus the consumer discovers that he has been taxed not only to pay high dividends during the war period but also in order that these same high dividends may be continued over the recession of industry which is bound to follow. Some of these reserves will find their way into stock dividends, thus creating more paper value upon which the country will be expected to pay a fair rate of profit.

Treasury Report on Corporate Income

The extraordinary nature of the profits of industry during the war years is manifest in so incomplete a document as that submitted to the Senate by the Treasury Department in 1919, entitled "Corporate Earnings and Government Revenue." This document purported to show the incomes of approximately 20,000 of the 31,500 corporations in the United States reporting incomes over 15 per cent on their capital stock.

Altogether these corporations earned an average return on capital stock of 33½ per cent after all taxes had been deducted. In other words, with three years of such good fortune as war brought, these corporations would make profits totaling the whole value of their capital stock.

The following table shows the great increase in profits enjoyed by the leading industrial groups.

CORPORATE EARNINGS IN 1917, BY MAIN GROUPS OF INDUSTRY

(From "Corporate Earnings and Government Revenues" — Senate Document 259.)

Industry	Per cent of net income for the year 1917 To capital stock Before deducting Taxes	To capital stock After deducting Taxes	To invested capital Before deducting Taxes	To invested capital After deducting Taxes
Fisheries	90.95	55.07	50.15	30.39
Banking and brokerage institutions	35.09	28.10	10.98	8.77
Business pursuits and personal services	36.56	29.01	22.28	17.68
Chemical and allied industries	52.36	41.76	34.89	22.08
Food and food preparations	41.89	33.48	31.57	23.19
Iron and steel industries	50.52	36.43	33.59	23.26
Leather and leather goods industries	33.32	26.41	23.41	18.35
Metal and metallurgical industries	28.79	22.89	22.03	16.93
Mining and mineral extraction	49.27	36.02	32.74	22.75
Paper printing, bookbinding and publishing	35.82	27.41	22.71	16.90
Special manufacturing industries	38.90	30.43	24.70	18.57
Stone, clay and glass industries	36.89	28.22	26.86	21.00
Textile industries	47.23	34.26	28.24	20.76
Timbering, logging, lumbering and woodworking industries	40.98	33.88	15.73	12.97
Trading	44.30	33.99	25.07	19.20
Transportation and public utilities	26.63	20.98	16.38	12.88
Total	44.34	33.51	25.95	19.11

There is no business group listed here with an average net income under 20 per cent. Over one-fourth of these corporations, 5,724 in number, showed net profits of over 50 per cent on capital stock. And over one-tenth of them (2,030) showed net profits of over 100 per cent. In other words, there were over 5,000 corporations which in 1917 earned over one-half the value of their capital stock and over 2,000 that earned the entire value in a single year.

Thus the statement that tremendous profits and high prices are closely associated is substantiated by data from two authoritative sources which certainly lean toward conservatism.

Small Quantities of Arsenic Have Been Found in Samples of Coke

CHEMISTS working in other industries than that of coal have occasionally referred to the presence of arsenic in coke. Investigation as to the occurrence of minute quantities of that substance in beer developed the fact that the malt used in brewing, when dried by direct contact with hot fuel gases derived from either coke or anthracite, absorbed or obtained by surface deposition a part of the arsenic which was volatilized during the burning of the fuel. The source of the arsenic was directly traced to the fuel, being originally derived from the iron pyrite or "brasses" which the coal contained.

Several years ago investigations in this direction were carried on at the Breslau Technical High School, in Germany, and this institution reported the following percentages of arsenic in the various samples of coke then under examination: Rhineland coke, 0.002 per cent; Westphalian coke, 0.011 per cent; Saar coke, 0.0052 per cent; American beehive coke, 0.0037 per cent.

Of course these percentages are exceedingly small and in practice would probably be lost sight of, yet the presence of the arsenic is interesting from a theoretical standpoint. Messrs. Archbutt and Jackson have formulated a satisfactory method for the determination of arsenic in coal and coke.

Designing Furnaces to Suit High-Ash and Non-Coking Coals of Varied Volatilities*

Making Chain-Grate Stoker Settings to Suit the Low-Grade Coals of the Southwest—Long High-Set and Steep Arches Spanning Large Percentage of Grate Best Suit High-Volatile High-Ash Coals

BY W. M. PARK†
East Chicago, Ind.

PRODUCTION of coal in the Southwestern fields of the United States has not kept pace with that of Eastern fields, owing to the smaller demand. This demand is affected by the extensive oil developments of that section and by the lesser density of population and fewer manufacturing enterprises. The quality of coal in this region varies from a good grade of anthracite containing 14,000 B.t.u. to low-grade lignite of 6,000 B.t.u. The anthracite field, which is in New Mexico, is of limited area and is mentioned merely to indicate the contrast in fuel quality found in small radius. The majority of the fuels of the Southwest contain ash in excess of 15 per cent which is of a composition that fuses readily into a sticky clinker.

Furnaces that will burn high-volatile coal running up to 40 per cent ash make it possible to make use of the bone from picking tables and so provide for great savings in the power bill. To this end it is necessary to secure plenty of radiant heat from the arch without introducing the disadvantage of an excessive throttling of furnace gases.

During the last eight years furnace design has developed beyond the experimental stage, however, and engineers can rationally design furnaces to use these fuels with the same assurance of ultimately satisfactory results that is felt when designing furnaces for Eastern coals. This article will describe a few modern settings with which creditable performance has been secured.

Fig. 1 shows a horizontal-pass boiler with a chain-grate stoker having a ratio of grate area to heating surface of 1 to 52. This grade readily comes to ignite and burns 40 lb. of coal hourly per square foot of grate area. Under test conditions it gave 72 per cent efficiency when burning a northwestern New Mexico coal of the following analysis:

Moisture, per cent	17
Volatile, per cent	33
Fixed carbon, per cent	33
Ash, per cent	17
B.t.u., commercial basis	8,500

The higher grade coals of New Mexico are used quite extensively in El Paso, Tex., on a number of chain-grates. All these coals are rich in volatile gas and some appear to contain, either in the volatile matter or in the lighter particles of ash, some element which attacks even the best grades of firebrick if the furnaces are so designed that the gas travels past the brickwork at a high velocity.

A furnace for a vertically baffled boiler is represented in Fig. 3. The outstanding features of design are the ample combustion chamber provided by setting the boiler 11.5 ft. under the front header, the high set and steeply sloped arch which in connection with the vertical bridge wall allows intense reflection and radiation of heat on the entering fuel, and a large opening between the arch and bridge wall to insure nominal gas velocity. This type of furnace has given highly satisfactory performance, operating continuously at averages of 15 per cent carbon dioxide and a loss due to fine coal passing through the grate openings to the ash pit of 2 per cent to 3 per cent when burning northeastern and north central New Mexico coals which have the following proximate analysis:

Moisture, per cent	2.87
Volatile, per cent	34.27
Fixed carbon, per cent	46.08
Ash, per cent	16.78
B.t.u., commercial basis	12,023

About sixty miles west of Fort Worth, Tex., is an isolated bituminous coal field of small area. The screened lump grades of this coal have a heating value of 12,500 B.t.u., and a large percentage of the output is used by the Texas & Pacific Ry., leaving a limited amount for domestic consumption in a territory traversed by this railroad. The screenings are burned on chain-grate stokers at several of the mine plants and at a large public service plant in Forth Worth. The better grades of screenings have a heating value of 10,500 B.t.u., while the lower grades run as low as 8,300 B.t.u. and have a proximate analysis of:

	Per Cent.
Moisture	3.50
Volatile	30.70
Fixed carbon	26.24
Ash	39.56

To burn this coal successfully it is necessary to cover approximately 90 per cent of the furnace with an arch set with a steep slope and ample height which in combination with a vertical bridge wall will cause intense reflection of heat upon the fuel bed at the entrance to the furnace. Such a furnace is shown in Fig. 4. Naturally, it is necessary also to provide unusually large grate surface to permit of burning large quantities of this low-grade fuel. Some of the stokers in operation at the mines have ratio of grate area to heating surface as low as 1 to 25.

In the western counties of Arkansas there is mined a

*Reprint of article entitled "Burning Low-Grade Coals of the Southwest" from *Electrical World*.

†Construction engineer, Green Engineering Co.

grade of coal known as semi-anthracite, having the following average analysis:

Moisture, per cent	3.5
Volatile, per cent	14.0
Fixed carbon, per cent	60.5
Ash, per cent	22.0
B.t.u., commercial basis	11,400

In regard to the glossy appearance of freshly broken pieces and the nature of the fracture this fuel is similar to Pocahontas coal. The percentage of volatile matter and moisture also approximates that of the latter fuel, but the different nature of the volatile content and the considerably higher percentage of ash give the coal characteristics in burning which are quite different from Pocahontas coal. When heated the tars appear to volatilize before they reach the temperature at which they would become plastic, in contrast with Eastern coking coal.

Instead of coking together in lumps, the smaller chunks disintegrate under heat so that the fuel bed is like a mass of loose sand. Because the coal has these characteristics it produces a dense fuel bed, and therefore the depth of fire must be less than that used with coals of high volatility for corresponding drafts and combustion rates. These low-volatile coals are perhaps the most difficult fuels to burn of all encountered in this district, on account of the difficulties of ignition. Even with the furnaces designed for the most intense concentration of heat at the ignition point, semi-anthracite coals will ignite only on the surface if radiant and reflected heat alone are depended upon. The ignition of fuel in the lower part of the fuel bed can be accelerated by use of a special gate having corrugated face tile in contact with the fuel.

Fig. 2 shows an experimental design of furnace first worked out in connection with semi-anthracite coal-burning problems. It involves an expensive lot of special tile shapes, and the cost of maintenance of the brickwork is high.

Equally good results may be expected with a simpler type of arch shown in Fig. 3, though for the boiler and for the length of stoker shown in Fig. 2 the furnace projection and length of arch should be increased when the reversed arch is eliminated.

From a long series of tests of from eight hours to twenty-four hours' duration, six are presented in the accompanying table. Efficiencies as high as 78.5 per cent were obtained where unusual pains were taken to maintain steady conditions, but the list chosen does not include the maximum results. Tests typical of results readily obtainable are of greater value to the engineer, and this point was borne in mind in making the selection.

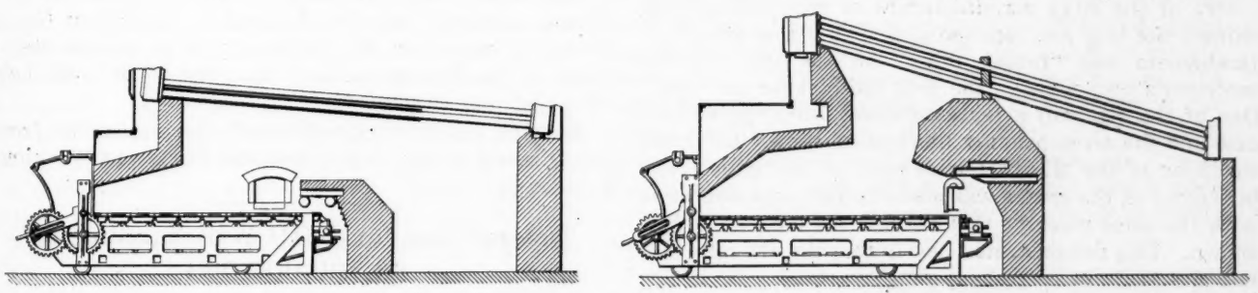
My experience in burning the Southwestern coals leads to the following conclusions:

1. On account of the high-ash content and fusible nature of their ash, these coals can be burned with highest efficiency and with least labor by use of a chain grate.

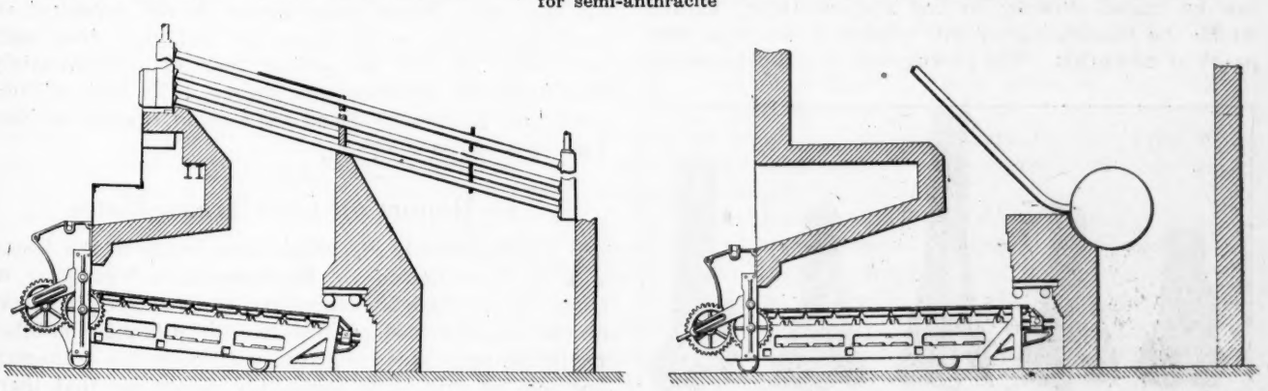
2. Most of the coals are of high volatile content,

ANALYSES OF SIX VARIETIES OF COAL

Name of Coal	Gallup, N. Mex.	Raton, N. Mex.	Strawn, Tex.	Dewar, Okla.	Jenny Lind, Ark.	Huntington, Ark.
Moisture	19.55	2.45	2.81	6.27	4.25	3.88
Volatile content	69.53	34.99	35.41	27.93	14.28	16.93
Fixed carbon	.....	46.08	40.23	46.37	58.89	56.06
Ash	10.92	16.48	21.55	19.43	22.58	23.13
B.t.u per lb. as fired	8,367	12,059	11,200	10,706	10,874	10,912
Percentage of combustible in refuse	.....	15.9	22.3	26.9	22.9	19.8
Furnace draft	0.27	0.12	0.11	0.23	0.27	0.38
Flue gas temperature	584	507	477	520	463	444
Carbon dioxide at furnace	15.5	15.6	12.2	12.6	13.5	12.4
Carbon dioxide at uptake	10.0	11.7	9.7	10.0	12.9	11.6
Coal burned hourly per square foot	40.2	26.6	24.65	27.5	32.1	28.5
Per cent builder's rating developed	146	154	134	139	170	148
Combined efficiency	71.8	72.8	73.6	71.7	74.1	72.2



FIGS. 1 AND 2. TWO SETTINGS THAT SUCCESSFULLY BURN THE FUELS FOR WHICH THEY WERE DESIGNED
In Fig. 1 the tile on the lower boiler tubes aid in maintaining high temperature. Fig. 2 is an experimental setting intended for semi-anthracite



FIGS. 3 AND 4. TWO OTHER EFFICIENT SETTINGS
The first embodies a spacious combustion chamber, a high, steep arch and an ample gas outlet. In the second the high, steep arch and vertical bridge wall afford intense heat reflection.

ignite readily and burn freely if provided with long, high-set arches.

3. Semi-anthracite coal ignites least readily, but if load conditions permit maintenance of steady furnace conditions, this fuel can be burned with high efficiency. Good overload also can be secured with liberal grate area.

4. As semi-anthracite crumbles in the fire rather than cokes together it is desirable, by the use of a stoker chain with finely divided and ample air space, to reduce sifting of the fuel and resulting holes in the fire.

5. To secure high furnace efficiency at high rating a large furnace volume is desirable. This is insured by setting horizontal water-tube boilers at a front header height of 8 ft. to 10 ft. if horizontally baffled and 10 ft. to 13 ft. if vertically baffled.

6. Provision should be made for furnace draft of 0.30 in. to 0.60 in., and liberal grate area should be furnished to insure good overload capacity when burning the medium and lower grades of these coals.

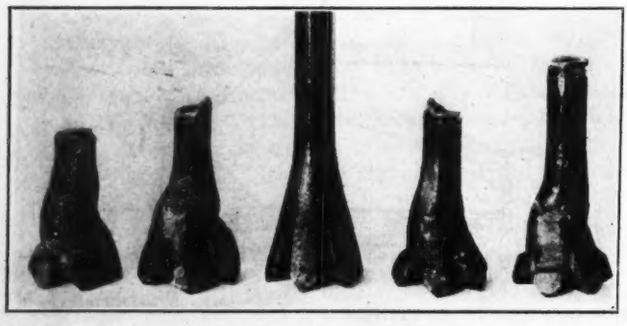
Good Blacksmithing Is Necessary to Obtain Good Drill Bits

By R. E. DUNN
New York City

MANUFACTURERS of rock-drilling machinery can and do make good rock drills and drill-steel sharpeners. They are unable, however, to eliminate the personal equation of the blacksmith. It would seem that the least informed person would realize that success in rock drilling is almost entirely dependent on the blacksmith turning out good steels. Although the drill-steel sharpener has gone far toward improving the quality of bits, yet, even with this improved and special machine, proper steels can be made only if care and judgment are exercised by the blacksmith.

One of the large manufacturers of rock-drilling machinery not long ago received a complaint that one of its jackhamers was "falling down" on the job. In the customer's own words, "the drill didn't have any pep." One of the company's representatives investigated this case and the accompanying illustration shows the actual condition of the bits that were used in this mine. The bit shown in the center was made by this representative with the same machine that formed the other four bits shown. This demonstrates clearly that the difficulty was not the fault of the sharpening machine. Is it any wonder that the drill "didn't have any pep"?

It is found that a large number of drill complaints can be traced directly to bad blacksmithing, against which the manufacturers are waging a continual campaign of education. The photograph also illustrates the problem with which the representatives of mining-machinery companies are frequently confronted, that is, complaints and dissatisfaction on the part of sincere but not thoroughly informed operators.



PROPERLY AND IMPROPERLY FORGED BITS

Geological Survey Issues Supplement on Coal Mining in Alaska

AS IT is tributary to the Government railroad and because of the coal-mining developments carried on by the Department of the Interior through the Alaskan Engineering Commission, the Matanuska coal field, in Alaska, is just now of special interest. The United States Geological Survey, of the Department of the Interior, has therefore issued, in its Bulletin 712-E, a paper by Theodore Chapin entitled "Mining Developments in the Matanuska Coal Field."

Mr. Chapin is in charge of the branch office of the Geological Survey at Anchorage, Alaska, and is actively co-operating with the Alaskan Engineering Commission in the development of these mines. His report is part of the Geological Survey's regular annual account of mining in Alaska and is based on several weeks' field work done at different times in the summer and fall of 1918 and on an intimate knowledge of the mining and prospecting that were done in that year.

The report includes a brief description of the general geology of the coal field, a statement of the results of tests and analyses of the coal, a detailed account of the mining and prospecting done in 1918, and descriptions of the geologic features at the mines and maps of areas near them, as well as many sections showing the geologic relations of the coal beds. The report is supplemental to the more general accounts of the geology and coal of the Matanuska Valley that have already been published by the Geological Survey.

The same bulletin contains also a short paper by Mr. Chapin entitled "Lode Development in the Willow Creek District," which is the customary brief annual statement of the developments of the year of the gold lode mines of that district.

Bulletin 712-E can be obtained free of charge from the Director of the U. S. Geological Survey at Washington, D. C.

Income Tax for 1919 Will Amount to $3,500,000,000

INCOME and excess profits taxes aggregating $908,829,172 were paid as the first installment of the tax bill for 1919. While these figures do not represent an exact one-fourth of the taxes for last year, they indicate collection for the entire year of approximately $3,500,000,000, Treasury officials say. The State of New York paid $214,644,232 and the Second District of New York paid $154,505,989.

To Report on Coal Traffic Rates

A FAVORABLE report has been made to the House on a resolution by Representative Thompson of Ohio, calling upon the Secretary of Commerce to report on the cost of transportation of coal by canals and other navigable waters as compared with costs for transporting coal by rail. The committee points out that there are wide differences in existing estimates of costs for coal carriage on both rail and water carriers.

Costs Constitute the Only Fair Basis For Fixing Prices

In Figuring Costs, It Is Held, Allowance Should Be Made for Reasonable Wages for the Proprietors and Equitable Interest on Capital Invested—Industries Will Prosper in Proportion to Their Freedom from Artificial Restraint

By Frank Wilbur Main*
Pittsburgh, Pa.

As IS sometimes pointed out, history confirms the fact that it is a trait of human nature for each generation to feel that the problems confronting it are more difficult, more unusual and more far-reaching in their effect than those that have ever been met by mankind before. It is also a universal human trait to feel that the solutions that are used in working out these problems are new and original. This is the *new* day of costs and cost accounting, so we are told, and in one way or another every business concern and every association and business man are being urged to base the selling price of their products upon the cost thereof.

Mr. Main's message, while not so intended, fits the present case of the coal operator. The impelling incentive for accurate cost keeping should come from within and not through orders with penalty provisions from a Governmental agency. Standardized fundamental methods of cost accounting are advocated. Writer believes with the coal operator that industry will prosper most when artificial restrictions are removed.

This latter I, of course, subscribe to and agree with, but I am afraid that the impression is often created that the calculating of costs is something new and something peculiar to our own day and generation, and yet I believe that if we will but stop and think we must realize that in every day and every age costs were obtained, not perhaps in all of their refinement, but costs nevertheless. Some nineteen hundred years ago the Greatest Teacher of all times made a statement in a manner which indicated that the obtaining of costs was a well recognized custom of procedure even at that time: "Which of you, intending to build a tower, sitteth not down first, and counteth the cost, whether he have sufficient to finish?"

The subject of costs is a branch of the science or art of accountancy and has been developed by accountants. These gentlemen, though not then so named, were in existence at the time of Caesar and helped calculate the costs of his foreign conquests. When Columbus discovered America the profession of accountancy was well established and this presupposes a knowledge and use of costs. This is true today, for the *Encyclopedia Britannica* defines accountancy as "a science by means of which all mercantile and financial transactions, whether in money or in money's worth, including operations completed and engagements undertaken to be fulfilled at once or in a future, however remote, may be recorded; and this science comprises a knowledge of the proper methods of preparing statistics . . . and of ascertaining or estimating on correct bases the cost of any operation, whether in money, in commodities, in time, in life or in any wasting property."

Speaking generally, and, of course, recognizing individual exceptions, costs have always, and of necessity, determined selling prices. The great trouble in the past was that while you would never fail to get attention when you talked of selling prices, each man thought his cost system was either too secret to be discussed or too unimportant to require special study. The price his competitor charged was sufficient cost system for him.

Herbert Hoover in a very interesting article on "Agricultural Readjustment and the High Cost of Living," in a very recent issue of *The Saturday Evening Post*, has stated that the cost of raising various farm products in this country is not the determining basis of selling prices, but that these selling prices are fixed by the impact of world wholesale prices. In other words, in respect to certain farm products which are grown the world over, the world cost rather than the United States cost is the predominating factor in this country. While with certain modifications this perhaps is true, yet it only confirms the fact that taking any product over a wide enough field, the selling price for any long-continued period cannot be less than cost.

I know that many will say that it is possible, even over a wide territory, to omit certain costs and to still continue production for a long period of time, also that it is possible for large business groups to carry on expensive side lines at the expense of more productive products. I, however, still contend that the cost of any product over a sufficiently wide area of territory, including reasonable wages for the proprietors and reasonable wage or interest return on the invested capital, is the dead level below which business or industry cannot indefinitely survive.

The instinctive struggle for life is so strong that no human being will willingly suffocate, and likewise no business will forever continue on a basis from which it cannot grow or develop. I am not speaking of unwarranted individual business enterprises; I am speaking of business trades and industries as a whole.

If cost is the basis for prices it is well to consider briefly just what is included in cost. I am not now speaking of "cost" as a technical accounting word,

*Senior partner in the accounting firm of Main & Co. and president of the Pennsylvania State Board of Examiners and Accountants.

which in many cases includes only part of the actual elements that determine the basis of prices, nor am I including in cost the profit which is and must be the inherent and natural reward of industry, ingenuity and genius (which profit is just as necessary for the continuation of any form of civilization as the elements of cost itself). The cost I am speaking of includes:

1. Wages and salaries.
2. Materials and supplies.
3. Overhead or burden, including administrative, general and selling expenses, depreciation, depletion, etc.
4. Remuneration of proprietors for own services.
5. Remuneration of investment for use thereof.

There can be no question as to the first three classes of expenditures. Our farming friends are just beginning to realize that their farming costs include a reasonable remuneration for the farmer and the members of his family for their own labor. This is also true in all other enterprises. The individual merchant often feels that he has made, say $15,000 in a year, when as a matter of fact he has made only that part of $15,000 which is in excess of a reasonable remuneration for his own services and a fair return on his capital invested.

There has been a great deal of discussion among accountants as to whether interest is or is not an item of cost. It is certain that that part of the investment in any business which is represented by borrowed capital carries an interest charge as a remuneration thereof which must be provided for. That part of the investment in excess of borrowed capital has just as much right to a fair remuneration as a farmer has for his own labor on his own farm, and unless properly rewarded capital gradually wastes away of dry-rot.

In these days when men are considering very seriously the various phases of industrial democracy and when so much emphasis has been placed upon the interest of the worker in the profit of the business, the inherent right of a return for capital on itself for its own services should always be kept in mind.

While costs are a basis of prices, I am nevertheless opposed to any attempt to place selling prices generally upon a cost plus basis. Cost plus contracts and cost plus arrangements have almost always been found, and I believe usually will be found, productive of waste, inefficiency and extravagance. I am in favor, however, of each industry, as far as possible, standardizing its fundamental methods of cost accounting procedure.

I am so certain of the economic principle that cost forms the basis of all prices, and am so opposed to *en masse* regulation, believing that the same stifles individual initiative and enterprise, whether governmental or association, that I believe that industries as a whole will prosper most naturally and effectively according to the degree that all artificial restraints are removed. Accurate knowledge by each association and by each business man of their own costs is the one unfailing safety valve.

While it probably is true that limited governmental regulation is necessary in respect to certain industries, I believe that the public could be far more protected if our Federal trade agencies were directed to the correction of abuses as the same arise, rather than to the regulation of all businesses and industries, as now seems to be attempted. I also feel that there is grave danger in individual associations attempting a regulation in their own trades which when exerted by the Government has been found to be most unsatisfactory and which I believe will be found almost unequally unsatisfactory by whomever it may be attempted.

We are realizing that any addition to normal cost, as, for instance, unscientific excess profit taxes, automatically and unfailingly raises prices to the customer. From general comment we might be led to believe that such a result was something that could not be foreseen. Yet in 1767, 153 years ago, there appeared in the *London Magazine* the following statement:

"Every new tax does not only affect the price of the commodity on which it is laid but that of all others, whether taxed or not, and which at first sight it seems to have no manner of connection. . . .

"Taxes, like the various streams which form a general inundation, by whatever channels they separately find admission, unite at last and overwhelm the whole. . . .

"The increase of taxes must increase the price of everything, whether taxed or not, and this is one principal cause of the present extraordinary advance of provisions and all the necessaries of life."

This is not a time to discuss taxes and I am mentioning this matter only to illustrate that any unnatural addition to cost cannot do other than produce unfavorable and distressing results, whether it be unscientific taxes, expensive regulation, unwarranted profit, or any other undue addition.

From a purely selfish standpoint, I am opposed to the addition of any excessive or unusual profit and I believe that no trade association can do any more important work than to agitate against unreasonable profits. Unreasonable profits will, in the long run, and looked upon from a world viewpoint, bring untoward results just as certainly as inadequate profits, and will do just as much to upset business conditions.

Peat, Widely Used as Fuel in Europe, is Much Used as Fertilizer in U. S.

PEAT may be utilized in numerous and varied ways. In the countries of northern Europe, a bulletin of the Geological Survey notes, it is used for fuel and as the basis for many manufacturing industries. Gas, charcoal, coke and a number of valuable byproducts are produced from it. Owing to the scarcity of raw materials in Europe peat and peat moss are employed also as substitutes for absorbent cotton in the preparation of surgical dressings, for wood, and for cotton and woolen cloth.

In the United States peat is utilized chiefly as fertilizer filler, as stable litter, and as an absorbent for the uncrystallized residues of beet and cane sugar refineries in the manufacture of stock feed.

Peat has long been used in fertilizing the soil, having been either applied as a direct fertilizer or used as a filler for commercial fertilizer. Analyses of the peats of the United States show an average nitrogen content of about 2 per cent, a proportion somewhat higher than that found in some commercial fertilizers.

The value of peat in soil fertilization is found in its nitrogen content and in the beneficial mechanical effect it produces upon certain lands. Black, thoroughly decomposed peats are most satisfactory for fertilizer, as such peats are generally heavier and more compact and contain more nitrogen and less fibrous material than the brown types.

What Barrier Coal Has Been and Should Be Left to Protect Anthracite Mines—I

Records Several Cases Where Barrier Pillars Were Provided, What Rock Overburden and Water Pressure They Sustained, Their Thickness, Height and Character and Their Ability to Satisfactorily Function—Some Experience Is Given as to Longitudinal Draw

BY W. B. RICHARDS*
Hazleton, Pa.

ONE of the most important subjects connected with the laying out of a mining property is the determination of the necessary, and therefore the required, width for barrier and shaft pillars. A barrier pillar is a coal rib left in place between the workings of adjoining mines. A shaft pillar is the coal reserved on either side of a shaft to protect the surface from subsidence and the shaft from distortion and injury. A fire pillar is a coal block into which normally a breast would have been driven, but which is left unworked in order to provide a solid pillar where a dam can be constructed. In case of a fire, the portion of the mine controlled can be sealed off by such a dam or flooded, without the balance of the operation being affected.

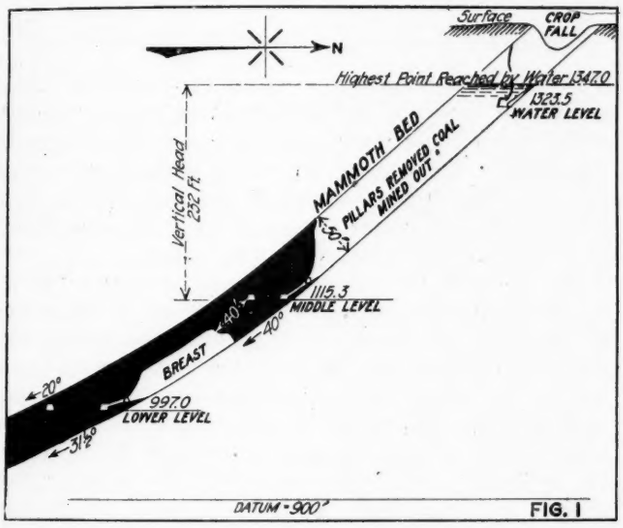


FIG. 1. SECTION THROUGH KEHLEY RUN MINE
This mine was flooded to extinguish a mine fire, the pressure of a 232-ft. head of water coming upon a pillar 40 ft. thick. This pressure was successfully sustained.

*Consulting engineer, Cranberry Creek Coal Co.

If adjoining mines are owned by a single company the barrier pillars usually are established approximately midway between the main openings of the two operations, so as to divide the territory equally. If adjoining properties are owned by different companies or individuals, the land line becomes the dividing line, and the barrier pillar is established on either side of this line as a center. Sometimes barrier pillars run lengthwise with the strike of the bed, and then one mine is below the other and the pillars run in the direction of the gangways. When they run parallel with the dip, they separate two mines that are side by side. In the event of a mine fire, a barrier pillar of sufficient strength would permit of flooding the burning mine to extinguish the fire, and there would be no danger to the employees in the neighboring operation. If a mine had reached the stage where it was unprofitable to work, it could with equal safety be abandoned and allowed to fill with water.

BARRIER PILLARS HAVE TO MEET THREE FORCES

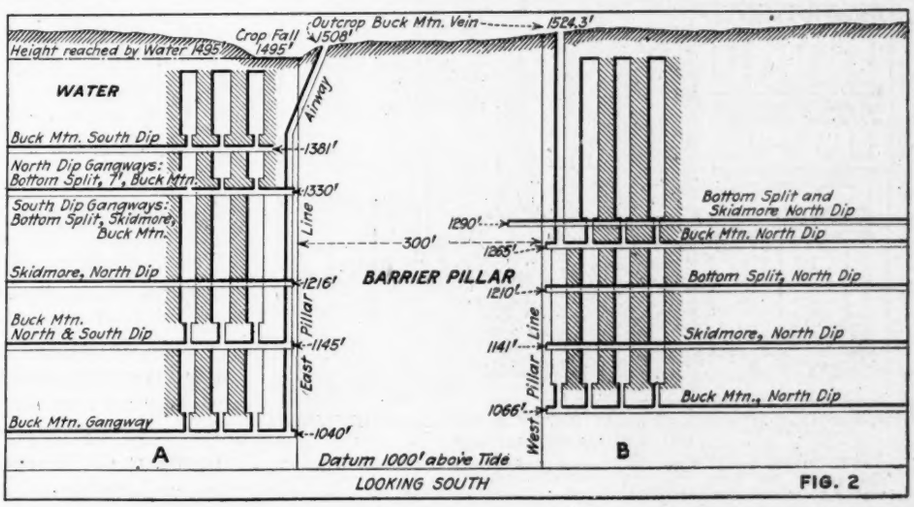
The decisive test of a barrier pillar comes when the bed has been completely robbed on both sides of the pillar. This coal must then bear the full weight of the overlying strata, and will be affected by the lateral draw. When one mine is abandoned and allowed to fill with water, the pressure of the water also pushes against this pillar, and these three combined forces have to be resisted.

The Anthracite Mining Law of Pennsylvania, Art. 3, Sec. 10, states that it shall be obligatory on the owners of adjoining coal properties to leave, or cause to be left,

FIG. 2

Plan of Barrier Pillar

This pillar, 300 ft. wide, resisted, without seepage, a 455-ft. head of water for fifteen years on the side marked "A," the workings on that side being allowed to fill with water. The pillar will be maintained at that width to a depth of 570 ft.



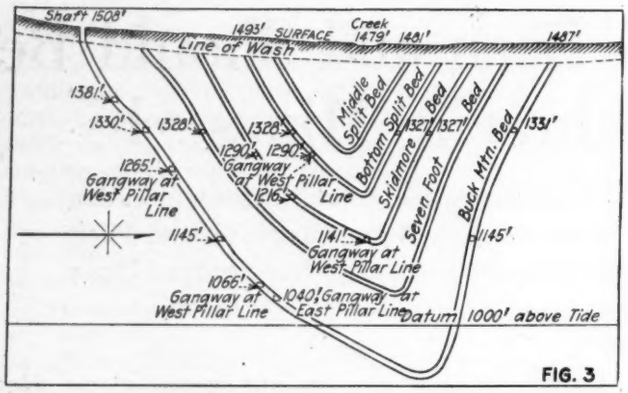


FIG. 3. VERTICAL SECTION ON THE LINE OF THE BARRIER PILLAR SHOWN IN FIG. 2

Four beds were worked. On one side of the barrier three beds and on the other side two beds were robbed to the pillar

a pillar of coal in each seam or bed of coal worked by them along the line of the adjoining property, of such width that, taken in connection with the pillar to be left by the adjoining property owners, it will be a sufficient barrier for the safety of all employees of either mine in case the other working should be abandoned and allowed to fill with water; such width of pillar to be determined by the engineers representing the adjoining property owners, together with the inspector of the district in which the mine is situated. The surveys of the face of the workings along such pillar shall be made in duplicate and must practically agree.

The prime factors governing the determination of the width of pillar required are: (1) The depth of the bed below the surface, which is the measure of pressure; (2) the compressive strength of the coal; (3) the inclination of the bed; (4) the thickness and nature of the bed, whether the coal is soft, shelly or hard; (5) the nature of the overlying strata.

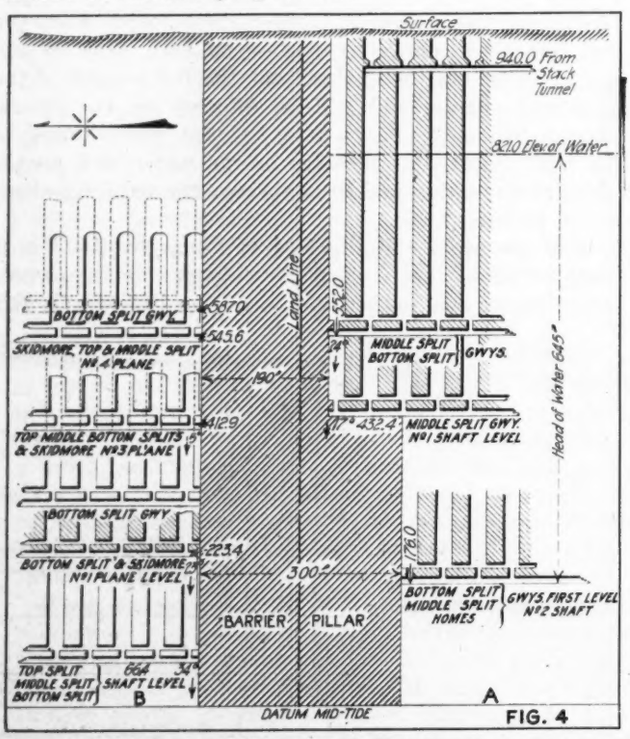


FIG. 4. LONGITUDINAL SECTION OF A BARRIER BETWEEN TWO ADJOINING MINES

Mine marked "A" was abandoned and allowed to fill with water. The pillar for years has successfully withstood the pressure of water to which it has been subjected

The following factors for determining the width of barrier pillars required have been investigated:

The squeezing and crushing strengths of anthracite coal have been tested under the auspices of the Anthracite Engineers Club of Scranton, Pa. The specific gravity and weight per cubic foot of the strata overlying the coal beds have been determined by John H. Savage, chemist of the Lehigh Coal & Navigation Co., of Lansford, Pa.

Barrier pillars have been tested under working conditions in the southern and western anthracite fields. Here pillars have been established, the mines abandoned, and allowed to fill with water, to depths ranging from 300 to 800 ft. from the surface, in coal varying from 10 to 50 ft. thick and inclined from zero to 70 deg.

By tests made on samples from the several coal fields, it has been found that a pressure of 216 tons to the square foot will cause the ordinary mine pillar to begin cracking, while a pressure about twice as great will crush it to powder. In general, other things being equal, the crushing strength of mine pillars varies inversely to the square root of the thickness of the bed. The same general rule apparently holds true for the squeezing strength in all cases where the height of the pillar is less than its width.

Crushing Strength 3 Tons Per Square Inch

In tall pillars, having a height greater than their width, the squeezing strength remains nearly constant, while the crushing strength continues to diminish with the height. The average squeezing strength of a mine pillar is about three thousand pounds to the square inch. The average crushing strength is about twice as much, or six thousand pounds to the square inch.

The pressure or weight upon a pillar varies directly as the depth from the surface, multiplied by the cosine of the angle of the dip. In general, the greater the depth, the larger must be the pillar. As the load producing the first crack in a mine pillar, that is a load such that the coal beings to scale on the outside of the block, is 216 tons to the square foot, and the weight of the overlying strata averages 163 lb. to the cubic foot, a level bed at a depth of 2,650 ft. below the surface supporting only the roof immediately below it would be under such a pressure that it would commence to squeeze. This statement is based on the assumption that the mass of strata resting on the pillar does not overhang. If the strata overhang, the pillar would commence to squeeze at a lesser depth.

The following table shows the average specific gravity and weight per cubic foot of slate, pea conglomerate, and hard gray sandstone from the mines at Lansford, Pa.:

	Specific Gravity	Weight per Cu.ft., Lb.
Slate	2.60	162
Pea conglomerate	2.65	165
Hard gray sandstone	2.68	167

The average weight of the strata overlying the Mammoth bed in the basin at Lansford is 163 lb. per cubic foot.

At the Harleigh Mines near Hazleton in the year 1877 the surface subsided, owing to the robbing of the pillars, and Black Creek broke into the mines. The barrier pillar established between the Harleigh and Ebervale mines was 45 ft. thick and the bed was 30 ft. in thickness and composed of good hard coal. The vertical

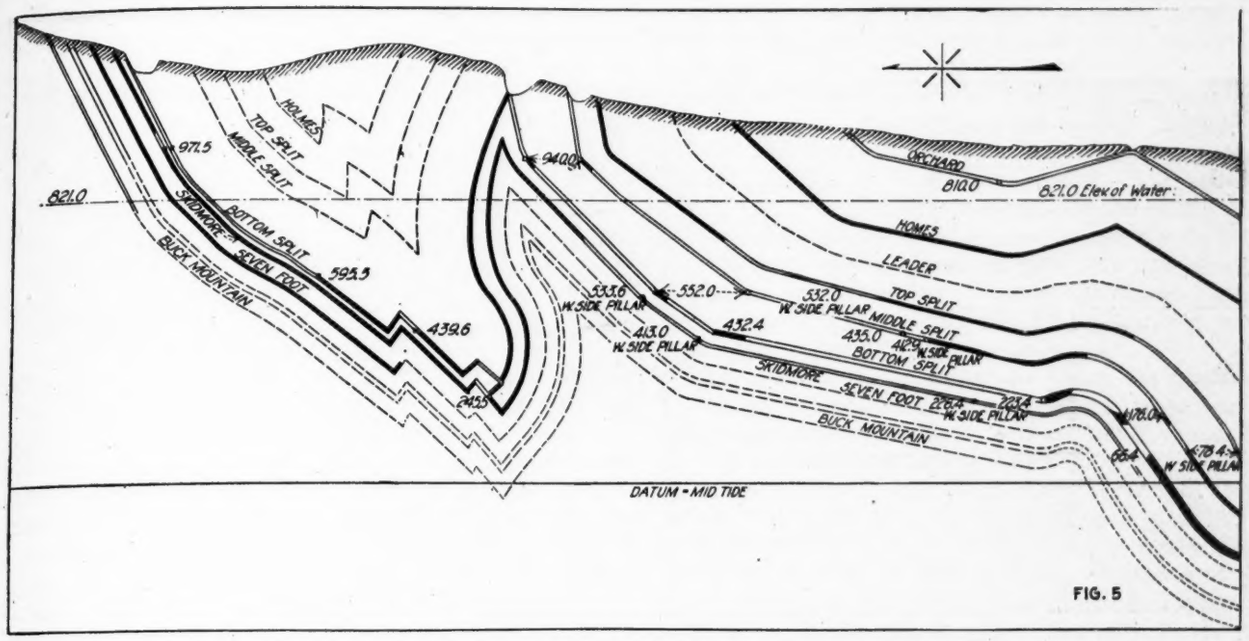


FIG. 5. VERTICAL SECTION ON THE LINE OF THE BARRIER PILLAR SHOWN IN FIG. 4
The pillar was made 190 ft. wide for a portion of its depth and 300 ft. wide for the balance

distance to the surface was 300 ft. When the water in the basin, or Lower Level, of the Harleigh mines had risen to height of 45 ft. it commenced to ooze through the barrier pillar into the Ebervale operation. The mine inspector did not consider this pillar strong enough to resist a head of water of this height, and notified the owners of the Ebervale mines of the conditions existing and of the danger that the barrier pillar might fail.

This was alarming news to the Ebervale people, as they did not anticipate that the caving-in of the Harleigh mines would be of so damaging a character to their operations. For their own safety, however, they were compelled to install at a great expense three additional pumps, column lines and steam lines. They then tapped the water by six 3-in. drill holes through the barrier pillar. They were thus compelled to handle the water from the Harleigh mines, as these workings by this time had been abandoned, and the pumps taken out.

Pillar Almost Collapses Under Pressure

At a colliery where a serious mine fire occurred an attempt had been made to extinguish it by sealing it up, and also by flushing, but both methods were unsuccessful, and the operators were compelled to flood the mines. The depth from the surface was 600 ft. and the bed was 16 ft. thick, while the barrier pillar was 130 ft. wide. When the water reached a height of 235 ft. the officials in the adjoining mines were alarmed by the large amount of water that percolated through the coal in the pillar. The coal was cracking and squeezing, and it appeared as if the pillar was yielding under the pressure of the water from the adjoining mine.

The mine inspector was called, and after an examination of the pillar he notified the company into whose mines the water was percolating through the barrier to suspend operations. He then notified the company that was flooding its mine to stop pumping water into it until the barrier pillar could be strengthened by flushing. A borehole was then drilled from the surface and two inside breasts were flushed full of culm. The flooding was then continued until water rose to a height of 415 ft. and the fire was extinguished.

In another mine a chain pillar 80 ft. thick was reserved as a barrier pillar. When the mine on the high side of this pillar was abandoned and allowed to fill with water, it percolated through the pillar in large quantities. The operators in the lower workings had to stand the extra expense of pumping this water.

In any given basin the mines will not all be exhausted at the same time. The mining company first to work out its coal will remove its pumping machinery, and allow the abandoned mine to fill with water. The barrier pillar must be of sufficient strength to resist the pressure of water that will then come against it.

This proves the importance of leaving barrier pillars or a dividing wall of sufficient strength between mines. Some mines have nearly reached the point of exhaustion, and will be abandoned and allowed to fill with water

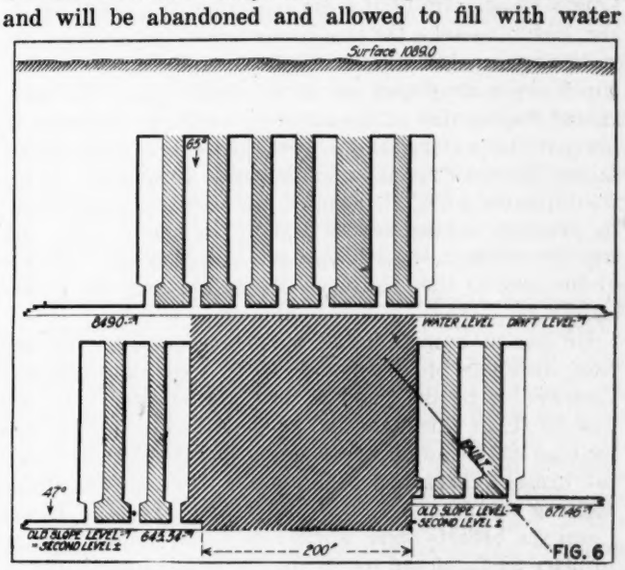


FIG. 6. LONGITUDINAL SECTION OF A BARRIER PILLAR LEFT BETWEEN SLOPES
This pillar is now withstanding a head of 205 ft. of water. It has successfully resisted this pressure for some time

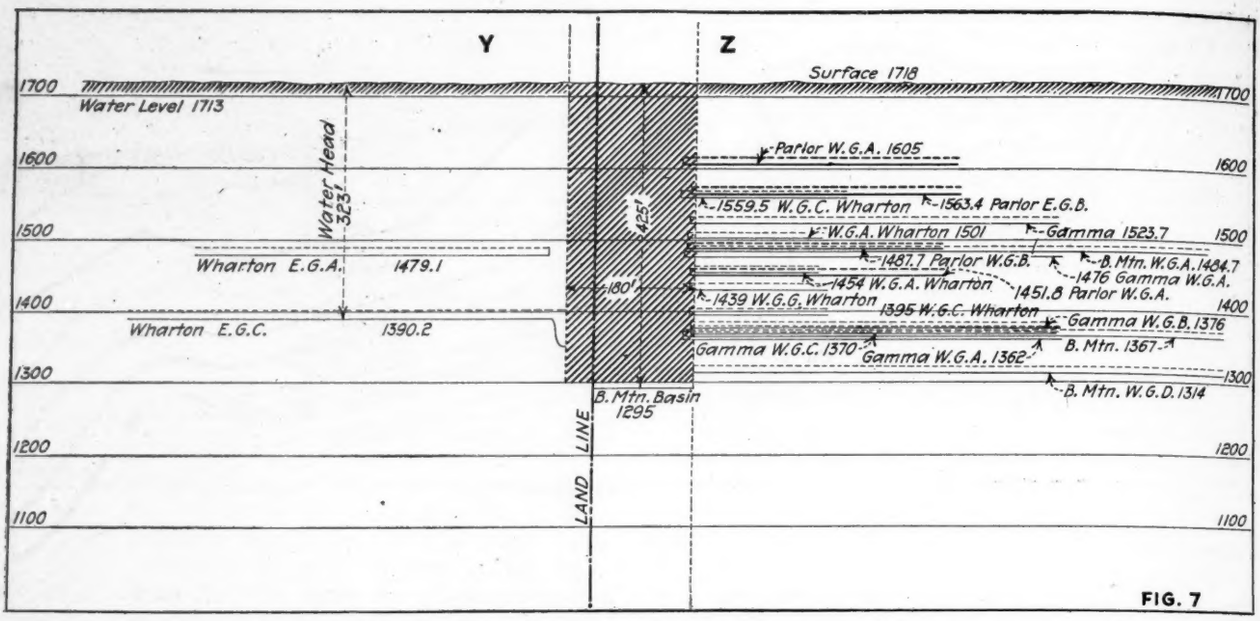


FIG. 7. LONGITUDINAL SECTION OF A BARRIER PILLAR 180 FT. WIDE
For years this pillar has successfully withstood a 323-ft. head of water, the mine marked "Y" being abandoned

without pillar strength being considered. The question will then arise: Is the barrier pillar of sufficient strength to resist the pressure of water that will come against it?

If it is the opinion of the engineers and mine inspector that it is not safe, the owners of the mine still operating will have to go to great expense in installing additional pumps, pump house, sumps, column lines, power lines, etc. In order to protect themselves they have to tap the water by drill holes through the barrier pillar and pump it from the abandoned mine. If the necessary width of barrier pillar had been left much trouble and worry for all parties concerned would have been obviated and an unnecessary expenditure of thousands of dollars would have been avoided.

Forty-Foot Pillar Withstands Water-Head

Fig. 1 is a cross section through the Kehley Run mine at Shenandoah. It shows the Water, Middle and Lower levels. In 1880 a serious mine fire occurred in the Middle Level. On the Lower Level to the west the workings were connected with the Kohinoor mines, which were developed at lower elevation. This prevented the flooding of the Kehley Run mine. In order to prevent the water flowing westward into the Kohinoor mines, the construction of a dam was considered. This would throw a 252-ft. head of water, equivalent to 110 lb. pressure per square inch, onto the chain pillar that was left between the Middle-Level gangway and the face of the breasts that had been driven up from the Lower Level.

On line of breast No. 12, which is shown on the section, the chain pillar was only 40 ft. thick, and this was supposed to be the point of least resistance. The bed was 50 ft. in thickness and of good hard coal. It was inclined at an angle of 40 deg. On the Middle Level the breast pillars had been robbed down to the stump heading and the top rock had fallen. On the Lower Level the breasts were worked 30 ft. in height, leaving in place 20 ft. of the top of the bed. The breast was 26 ft. wide.

It was the opinion of the mine inspector and the engineers that under these conditions the chain pillar, which was 40 ft. wide, would be of sufficient strength to hold the water. Brick dams were accordingly constructed on the Middle and Lower levels, and the mine filled with water. The chain pillar of 40 ft. width successfully held the hydraulic pressure thus imposed.

Another Pitching Pillar Holds Back Water

Packer No. 2 Colliery was flooded to extinguish a mine fire in the Mammoth Vein. The bed at this point was 37 ft. thick and was composed of good hard coal, dipping 43 deg. A chain pillar 66 ft. thick successfully resisted a head of water of 315 feet. The breast pillars were all in place. This illustrates the strength of a bed on the pitch where it is in good condition and hard.

Fig. 2 is a longitudinal section showing a barrier pillar that was established between adjoining mines. It was 300 ft. wide and was to remain that width from the surface to the basin, a depth of 570 ft. The mine marked "A" was abandoned and allowed to fill with water. The lowest gangway worked was at an elevation of 1,040 ft. above tide. The elevation of the overflow at the surface was 1,495 ft., giving a head of water of 455 ft. There were three beds mined and robbed at the pillar line—the Bottom Split 9 ft. thick, the Skidmore 10 ft. thick, and the Buck Mountain 23 ft. thick.

In the mine on the right marked "B" the Skidmore and Buck Mountain Bed had been worked and robbed to the pillar line. The latter bed from the bottom slate upward consisted of 1 ft. of dirt, 14 ft. of good coal, 8 ft. of slate, coal and dirt, and a hard sandstone top.

The width of this pillar was established by the mine inspector, although the engineers for the adjoining mines did not believe that so wide a pillar was necessary. This pillar was in existence and successfully held back the water for about fifteen years when the water was pumped out and the mine re-opened. Fig. 3 is a cross-section on the line of this pillar.

Fig. 4 is a longitudinal section showing a barrier pillar that was established between adjoining mines by the mine inspector and the engineers of the adjoining operations. Mine marked "A" was abandoned and

filled with water. The elevation of the lowest gangway was 176 ft. above tide, while that of the overflow at the surface was 821 ft., thus giving a head of water of 645 ft. The gangway was 800 ft. in depth from the surface. At this depth a barrier pillar 300 ft. thick was left. The bed was 20 ft. thick, and consisted from the bottom slate upward of 3 ft. of good coal, 1 ft. of dirt, 12 ft. of good coal, then 4 ft. of dirt, soft coal and clod; the inclination was 25 deg. The bed was completely robbed on both sides of the barrier pillar.

In the same mine, in a different bed at a gangway elevation of 432 ft. above tide and at a depth of 600 ft. from the surface, there is a head of water of 390 ft. The barrier pillar at this level is 190 ft. in width. The bed is ten feet thick and of good hard coal, inclined from 25 to 45 deg. The bed was completely robbed at the pillar line in mine marked "A". In the adjoining operation, marked "B," breasts were driven in the Skidmore bed 5 ft. thick, the bottom split 20 ft. thick and the middle split 10 ft. thick, that is in the same beds as those worked in mine marked "A," but the breast pillars have here not yet been drawn. This barrier pillar for years has resisted the pressure of water to which it has been exposed.

In Deep Mines 300-Ft. Ribs Have Been Left

At the level located 432 ft. above tide the workings in the mine marked "A" had been driven years ago to within 40 ft. of the land line. When the mine adjoining, which was developed at a later date, approached that line, 150 ft. of pillar on its side of the line was left in place, making the barrier pillar at this level 190 ft. wide. Below this level the mine inspector and engineers of the adjoining mines decided that a pillar 300 ft. wide would be required, each mine to leave 150 ft. on its side of the land line. This pillar was established to the basin, a depth of 1,400 ft. from the surface. The bottom split of the Mammoth Vein was 1,200 ft. from the surface. Fig. 5 is a cross-section on the line of this pillar.

Longitudinal section, Fig. 6, shows a barrier pillar 200 ft. in width that was established in the Primrose bed between the workings of adjoining slopes. Both slopes were abandoned and filled with water. There were two levels, namely, the Water and Slope levels. The former was robbed completely. On the slope level the bed was robbed on both sides of the barrier pillar. This level was 450 ft. in depth from the surface, and the head of water was 205 ft. The bed was 12 ft. thick. Starting from the bottom slate it consisted of 1 ft. of shelly coal, 8 ft. of good coal and 2 ft. of dirty coal. The bed pitched 50 deg. This pillar stood the test for years. The water was finally removed from one slope, but the other is still full.

Longitudinal section Fig. 7 shows a barrier pillar 180 ft. in width. The mine marked "Y" was abandoned and allowed to fill with water, the head being 323 ft. This pillar was established to the basin, a depth of 425 ft. The Wharton Vein is 10 ft. thick, and contains 2 ft. of shelly coal. This pillar has stood for years.

How Much Pillar Must Be Left Under Tunnel?

In a mine where a pillar 300 ft. wide was left under water-level tunnel the depth from the surface to the gangway was 500 ft., the vertical height from the gangway to the tunnel was 315 ft., the pitch distance 410 ft., and the bed was 50 ft. thick, inclining 48 deg. The breast and gangway pillars were completely robbed on both sides of this reservation pillar, and the lateral draw did not reach to the tunnel.

In another mine where a pillar 140 ft. wide was reserved under a panel tunnel the vertical height was 270 ft., the pitch distance 400 ft., inclination 50 deg. and the bed 14 ft. thick of good coal. The bed was robbed on both sides of this pillar, and the lateral draw did not affect the tunnel. If in such a case as the above the reservation pillars had not been left wide enough, the lateral draw would have injured the tunnel, causing the rock which formed its roof to fall, and it would then have required timber for its support.

The problem of the extent to which the horizontal draw over a barrier pillar will extend when coal is extracted on either side of it is a matter demanding careful consideration and a factor of safety must be allowed to prevent the break from occurring at the tunnel which the pillar is intended to protect.

While driving a breast on line along a barrier pillar, in the top split of the Mammoth bed, which was at that point 14 ft. thick and on a 30-deg. pitch, a jump or roll in the bottom was struck, rising vertically 40 ft. The breast was driven up over the roll to the surface. When the breast pillars were being robbed, and additional weight was thrown on the barrier pillar, the coal squeezed out for 12 ft. along the roll, and weakened the pillar materially.

At another place where a barrier pillar had been established for the Buck Mountain bed, which was here 15 ft. thick and inclined 35 deg., when driving the breast along the pillar on line a slip was encountered in the bed and the coal slid out of the pillar 15 ft., thus decreasing by this much the width of the established pillar.

In many instances the miners, when driving a breast on line along a barrier pillar, encroach upon it, especially if the coal is good and they are being paid by the car. Frail coal and coal that disintegrates rapidly when exposed to the air, together with a soft bottom, require a larger pillar than when the coal is hard. If the strata overlying a barrier pillar overhangs, it throws additional weight on the pillar. This acts as a lever on the coal, crushing the pillar along its edge. Accordingly coal is often squeezed off the pillar for a depth of 10 to 15 ft. from its edge. Since barrier and shaft pillars must stand for a long time and are subject to disintegration and atmospheric effects, such conditions should be considered when determining the width of these pillars.

(To Be Continued)

Geological Survey Issues Map of Coal Fields

THE U. S. Geological Survey, Department of the Interior, is now distributing a large map showing the coal fields of the United States. This map, which measures 4½ x 7 feet, shows the coal fields by a series of colors indicating the seven different kinds or grades of coal as it is classified by the Geological Survey—anthracite, semi-bituminous, high-grade bituminous, low-grade bituminous, lignite and coking coal. The map is sold by the Geological Survey for $1, or for 60 cents each if five or more maps are ordered together. Besides the coal fields this map shows all the cities, railroads, lakes and other features usual on a map of this size.

Coal Beds Near Panama Promise Big Coal Industry in Colombia

Engineers Agree That Exploitation for Commercial Purposes Is Practicable—Government Officials Are Anxious to Lend Encouragement

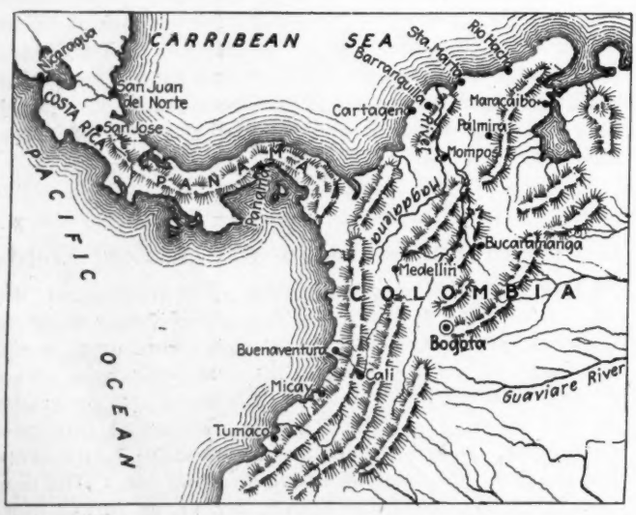
IN THE foothills of the Western Andes near Cali, Colombia, Trade Commissioner P. L. Bell reports, the general dip of the outcroppings of coal and the shape and position of the valley are generally conceded to indicate the presence of coal beds under the level floor of the valley.

The veins so far discovered extend from Guachinte, southeast of Cali, to Punta Yumbo, northwest of Cali, a distance of approximately 83 km.—on the map herewith Cali will be seen southwest of Bogota. This coal is bituminous, somewhat friable, steams easily, and will coke nicely. The following analysis indicates its quality: Volatile matter, about 23 per cent; ash, between 5.38 and 7.66 per cent; sulphur, about 0.77 per cent; and free carbon, between 68.05 and 70.58 per cent.

The importance of this coal reserve so near the Panama Canal is well understood, and it is confidently predicted that coal mining will be one of the important industries of the future. Good coal is badly needed for both rail and water transportation on the west coast of South America.

Engineers who have examined the Cali deposits agree that their exploitation for commercial purposes is entirely practicable; and the Government officials are anxious to encourage the development of the department. There is one serious drawback to the development of these reserves, namely, the limited carrying capacity of the Pacific Railway between Cali and Buenaventura.

Five or six mines are now in operation near Cali with a total monthly output of approximately 3,000 tons, but the work is not carried on steadily, and the mine equipment is antiquated. An average of from 250 to 300 men are employed at the mines, but the tonnage production per man is low and the mining costs are high. At present little coal is used locally except by the Pacific Railway, which purchases most of the output of the Cali mines. Some coal was shipped recently to Peru and Ecuador, but the high cost of handling made it an unprofitable business. The cost of coal at Cali, delivered at railway freight sheds, is $7 per ton.



MAP SHOWING THE LOCATION OF CALI, NEAR WHERE IMPORTANT COAL DEPOSITS HAVE BEEN RECENTLY DISCOVERED

No real development work has been undertaken by foreign interests. Some prospecting was recently started by two Americans; and the Canal Commission at one time offered to take steps toward the exploitation of the Cali coal beds, but abandoned the idea because of the excessive prices demanded by the owners of local coal lands for the purchase of their property.

Coal lands do not come under the existing mining laws, and are, therefore, not open for location of claims. Coal reserves are generally held to be the property of the Government unless the title of the owner of the land antedates the land laws of 1876. Most titles in the Cali district to antedate 1876 and therefore give the owners free right to sell or work their coal fields, but any foreign company entering the field in the future should have some arrangement with the Government before making any purchases.

Sulphite Liquor Makes Briquet Binder and Cheap Fuel

ONE of the troublesome paper or rather pulp-mill wastes is the spent sulphite liquor, but at least four classes of useful materials are now made from this material. Of these alcohol has received the most publicity. It is secured by providing for the fermentation of the carbo-hydrates, gums, etc., in the liquor. Several such alcohol plants are in operation and in the United States the Government has been interested in a plant erected to obtain alcohol for military purposes.

If sulphite liquor is neutralized with lime and magnesia and then evaporated under vacuum, a thick syrup results, and upon carefully drying this a gum, or adhesive, is secured. It has been used successfully as a binder for fuel briquets. Some regard it as being more suitable than pitch for briquetting purposes, being cheaper and more effective. Less binder also is required. It burns completely in the ordinary fire.

In Sweden a unique method for using the lignin in the liquor for fuel purposes has been worked out and a few mills recover enough to furnish their own fuel. The process is known by the name of the inventor—Strehlenert. The solid substances in sulphite liquor are precipitated under conditions which permit of the recovery of from 60 to 90 per cent of the sulphite dioxide in the liquor, and this can be used over again, while the lignin secured, when ready to burn, has a thermal value of some 7,000 calories (12,600 B.t.u.). One hundred and fifty pounds of the finished fuel are required from each 1,000 lb. to carry on the process, leaving a net result of 850 lb. This plan of conserving fuel, while utilizing a large volume of waste, was suggested about 1913, since which time progress has been made in Norway and Sweden, where fuel conditions are favorable to such processes.

Spruce turpentine is a comparatively recent product of the sulphite process, and it has been recently shown that carvacrol may be made commercially from it. Carvacrol has been proved an efficient substitute for thymol, and thymol is much in demand for fighting the hookworm (still so prevalent in certain European mines) and for general antiseptic manufacture. The supply of thymol is far short of the demand.

Department Seeks Operators' Help In Leasing Coal Lands

Safe, Efficient Operation of Mines Opened Under Leasing Act on Public Lands Assured by Supervision of Bureau of Mines

PREPARATORY to the issuance of final regulations to govern coal mining under the Mineral Leasing Act, a conference was held of Interior Department officials and those interested in operating regulations. Representatives of the governors of the public land states were present as well as representatives of the National Coal Association, the American Institute of Mining and Metallurgical Engineers and the American Mining Congress. The opening address of Assistant Secretary Vogelsang sets forth clearly the purposes of the meeting and the difficulties which must be met. His remarks, in part, were as follows:

"I wish to make a short preliminary statement to the effect that you, representing the coal operators of the country, have been called together by this department, and you have been named by various authorities, governors of the different states in which the Government's fuel reserves—coal reserves—are located, to confer with us with reference to the operating regulations that shall be adopted for the conduct of coal mining henceforth on the public lands of the United States.

"You realize that in the passage of what is known as the Leasing Act, on Feb. 25 last, the Government has made a very radical departure from its former conduct of the acquisition of these mineral lands. By that act the relation of landlord and tenant practically has been established, and we wish to prepare at this meeting the chart by which the operation of coal mining on the Government leases shall be conducted.

Human Welfare Involved in Coal Mining

"That act, of course, embraces the oil reserves as well as the coal reserves, and we had a meeting [of oil operators] similar to this, much more largely attended because it appeared to be of very much greater interest, owing to disputed titles and operation already in the field on lands claimed by the Government, and these gentlemen, representing the various oil interests of the country, were called in and we passed upon and adopted a set of operating regulations governing oil mining.

"Mining of coal, I need not say, is a very different proposition. The number of men employed in coal mining is infinitely greater and the question of human welfare is more intimately associated with coal mining. The question of safety of life and methods of operation, in order that the reserves may be properly extracted, lives may be preserved, etc., is a much more vital element in this discussion than it was in that of the oil leases.

"So we want you to approach this subject with perfectly open minds and to advise us as carefully and conscientiously as possible, to the end that what we are attempting to achieve here may not hereafter need very copious amendment or change. As public landlords we are charged with the duty of achieving as best we may the most desirable result with reference to extraction of the minerals and products of mines and miners."

George S. Rice, the chief mining engineer of the Bureau of Mines, made the following statement:

"The Alaskan Leasing Act did not make the same specifications as to the welfare of the miners as called for in this present new leasing act, but the administration to a certain extent has been in the hands of the Government through the Inspector of Alaska in the Department of the Interior. In the case of public domain, the state furnished inspection regulations, but they are not always adequate, and vary from state to state. Therefore to formulate regulations which under the act must take care of the safety, health and welfare of the miners it necessarily means going carefully into details.

"I also suggest that one of the important things for a prospective lessee is to have before him specifications of all the requirements of his contract before he signs it, so that he may open a mine with the full understanding of what is expected of him. Otherwise there are bound to arise difficulties, if a Federal inspector later on tries to enforce, without specified regulations, what he considers are proper requirements for safe and efficient mining.

"The Government has been very severely criticized, in fact as recently as this last winter, by one of the most eminent coal mining engineers of the country, who has had experience on the Indian lands under supposed Government supervision. He stated that the worst mining, so far as safety and conservation are concerned, was being practiced by the Government on Indian lands. This was true, but I do not think it is true now, as the Bureau of Mines is furnishing technical advice.

"It has been an extremely difficult thing to remedy early conditions. There were no regulations of any value when those leases were undertaken, and it has been an uphill job for the representatives of the Bureau of Mines, since this organization was charged with supervision, to bring the operations under safe control and to obtain more efficient mining practices. There have been great losses of coal in the past, as well as avoidable losses of life, and it was with these thoughts in mind that these regulations were prepared."

Transportation Act Provision To End Tie-ups

An emergency provision of the new Transportation Act under which the Interstate Commerce Commission will take steps to end freight tie-up reads: "Whenever the commission is of the opinion that shortage of equipment, congestion of traffic or other emergency requiring immediate action exists in any part of the country the commission shall have authority at once to suspend the operation of rules, regulations or practices with respect to car service; to make such directions with respect to car service without regard to ownership of locomotives, cars and other vehicles during such emergency as in its opinion will best promote service in the interests of the public; to require joint use of terminals, and to give directions for priority in transportation, embargoes or movement of traffic."

The Labor Situation

Edited by
R. Dawson Hall

Men Want Alien Union Officer Ousted

ONLY the presence of a large number of deputy sheriffs of Harrison and Marion counties prevented a riot among the miners of the Consolidation Coal Co's plant at Wyatt, W. Va., on Wednesday, May 12, the trouble arising from a statement that a foreigner was holding an office in the local union. When the superintendent at the plant sought to act as peacemaker he was threatened with violence.

An official announcement was made late Wednesday afternoon at the offices of the Consolidation Coal Co. in Fairmont that the trouble had been satisfactorily settled at a meeting of company officials and officers of the United Mine Workers and that the men would return to work Thursday morning.

Prospects of Unionism in Mingo County

OUTSIDE of the trouble at the village of Lynn, in which 11 persons were killed, conditions remain practically unchanged with reference to the organization of the Mingo (W. Va.) field, although officials of the United Mine Workers are making claims of growth in the number of miners organized, Fred Mooney, secretary of district 17, stating that 2,600 miners among fourteen different locals have joined the United Mine Workers, but that all such men have been dismissed from the service of the coal companies and were living in tents.

If such were the case it would be causing a heavy loss in production. Production reports, however, disclose only a negligible loss from labor shortage, so that little credence is given the report that any considerable number of miners have been organized. The movement to organize the field is in a sense a hybrid one because at such meetings as have been held time is divided between organization speeches and addresses urging the nomination of Samuel B. Montgomery, State Labor Commissioner, for governor, Montgomery posing as the special friend of labor.

Fairmont Field Asks "What Is a Bonus?"

IT WAS necessary to continue throughout the second week of May the conference between the operators of the northern West Virginia fields and the officials of district 17, some difference of opinoin having arisen between the miners and operators as to what had in the past constituted a bonus, this question having arisen in connection with the effort to agree on a dead-work scale. Operators advanced the claim that yardage in narrow work had always been regarded as a bonus, while, on the other hand, the miners' representative stated that payment for yardage in narrow work had always been made to correct local deficiencies in the coal seam.

As a step toward settling the matter in controversy it was decided to make an investigation of conditions at Wendell, at the Bertha mine near Morgantown and at the Purseglove mine also in Monongalia county.

It was deemed advisable to designate a committee to visit the Galloway mine and to ascertain the labor required in connection with narrow work. On the committee so appointed were C. J. Ryan, Hepzibah; John W. Bischoff, Elkins, and George S. Brackett, of Elkins, the miners' representatives being J. F. Farnasch, Grafton; Nick Aiello, and W. F. Ray, district-board members of Fairmont.

German Mine Workers to Open Up Spitzbergen Mines

A CHRISTIANIA firm known as A. S. Isefjord Kulkompani has been recently formed to operate the coal measures bordering on Isefjord, Storfjord, Green Harbor (west side), Advent Bay Point, and Kap Boheman in Spitzbergen. The capital of the company is German, Norwegian and Dutch. If circumstances favor the project, five hundred German mine workers will be sent out, in June next, with the necessary housing material and machinery for an immediate start.

From time to time, beginning in 1885, claims have been staked out by Nilsson and Schroeder, wire fences have been built around them and a watch set over them. They have been registered on the Norwegian Foreign Office Chart as 19 and 49, and were finally sold to the new company. The directors are Herman Jensen, chairman; Baron von Fuchs, and Henry Drysselhuys, Rotterdam, with G. Siewers as managing director.

Indiana Strikes Against Wage Scale

ELEVEN mines in the Clinton coal field of Indiana have been closed because the shot firers refused to work under the new wage scale fixed by the operators. It provides a maximum remuneration of $1 per hour, or $8 per day, for that class of work. At twenty-one mines operations are suspended because the mine workers refuse to work on Saturdays, protesting against the Bituminous Coal Commission's refusal to grant a five-day week.

Men at Anthracite Colliery Want More Pay

MINERS employed at the Evans colliery at Beaver Meadow, near Hazleton, Pa., went on strike May 17 for a wage advance of $2.50 per car. The company has offered to grant an increase of $2.19, but the men reject this offer.

Three Thousand Alabama Miners Quit

FROM Birmingham, Ala., come reports that on May 19 nearly three thousand men quit work in widely separated sections of the coal mining district of Alabama. A number of mines were compelled to suspend operations because of a shortage of labor.

Discussion by Readers

Edited by
James T. Beard

Interesting Facts Regarding the Working of Coal Under a River or the Sea

THE inquiry of Arthur L. Sheldon, *Coal Age*, Feb. 26, p. 419, interested me, as I have worked seams of coal varying from 2 ft. to 8 ft., in thickness, under conditions similar to those he has described. It may be that my experience will be of some help to our friend, Mr. Sheldon, and I give it for what it is worth.

The three seams overlying eact other, in this proposition, can be worked by either a shaft or a slope opening. Judging from the data given, however, a slope driven on an inclination of 1 in 7, or 1 in 8 appeals to me as having an advantage over a shaft opening. By installing a main rope-haulage system in such a slope, it would be possible to handle any desired output at the least possible expense. In slope haulage, a trip of empties can be dropped onto the landing, in any of the three seams, and a corresponding trip of loaded cars hauled to the surface with much less delay than will generally occur in hoisting in a shaft.

My experience in the working of the room-and-pillar and longwall systems of mining coal inclines me to think that the only proper method to adopt in this field is to work No. 1 seam, lying at a depth of 50 ft. below the surface, by the longwall advancing system; and apply the longwall retreating system to the middle or No. 2 seam, lying 50 ft. lower down. Further investigation might suggest the use of the room-and-pillar system, however, in No. 2 seam, and I would use the last named system in working the lowest or No. 3 seam, which lies at a depth of 160 ft. below the surface.

Only Narrow Work to Be Driven Under the River or an Overlying Seam

In all three of these seams, only the necessary narrow places should be driven under the river, and I would recommend supporting the roof of these headings securely, with either steel girders or good timber. In addition, I would give the roof and sides of the headings a coat of gunite, to prevent the slacking of the coal on the ribs or the cutting of the roof by the air, either of which will cause much trouble later. There should also be left sufficient pillars, in all three seams, on both sides of the river, to avoid the possibility of any break extending to the river bed, whereby water would flow into the workings.

In working these seams, it is absolutely essential that nothing but narrow work must be driven in an underlying seam, until the same area in the seam above has been worked out and abandoned. This applies to the driving of narrow rooms or stalls, in a lower seam, only when the roof is good and care is taken to see that the designated width is not exceeded by the men. Thus, for any given area, the coal must have been taken out and the roads abandoned in No. 1 seam before extraction is begun in No. 2 seam. Likewise, the extraction must be complete and roads abandoned in No. 2 seam before the same work is started in No. 3 seam below.

Working the coal in one of the lower seams in advance of the extraction in an upper seam would simply mean the ruination of that field. Judging from a long experience in the mining of coal by both of these methods, I have every confidence in saying that if the work is conducted in the manner I have indicated, the output of coal from these three seams can be maintained at the desired maximum and at a minimum cost of production. The timber supply will be reduced to a minimum and the extraction of coal will reach practically one hundred per cent.

Draw No Pillars Under the River

Just a word, in closing, to sound a warning against the proposal made by one of the contributors in this discussion, who stated that it might be possible, with due care to withdraw the pillars in No. 3 seam, under the river, when finishing. Let me say that this would be a great risk and endanger the life of every man underground, from the very first day the work of drawing these pilars was started. With only 160 ft. of cover, there would be the danger of an inrush of water occurring at any moment.

When engaged in a mining operation near the Atlantic Ocean, where the workings extended two-and-one-half miles from the coast line under the sea, at this distance out we had 1,500 ft. of cover separating the seam from the bed of the ocean. In that case, the mining law required that only the necessary haulage road, airway and manway could be driven under the sea, until the thickness of strata above the seam between it and the bed of the ocean exceeded 500 ft. of solid rock strata.

In another instance, I had the experience of being in a locality where the river broke into a mine, drowning out the men. In the same district, about three miles distant, a canal flooded another mine. These experiences lead me to state that under no conditions should the pillars be drawn under the river in these seams.

McKeesport, Pa. ANDREW O. BAIN.

Workers Must Use Good Judgment When Asking for a Change of Work

THE incident cited in the inquiry of A. H., *Coal Age*, Feb. 12, p. 327, giving his experience and opinion regarding the treatment he received at the hands of a mine superintendent, was interesting to read. Unfortunately, there are many instances of this or a similar nature happening daily in the industrial world; and yet it is my belief that the world is growing better in respect to the treatment of workers by their employers and *vice versa*.

It may be said with much truth that complaints of the kind here mentioned are less frequently heard than

formerly, and when such a condition does come to our attention we wonder that it is possible in an up-to-date organization, today.

One can recall many instances that occurred in past years, similar to this one. Often, they were loudly exploited but seldom satisfactorily settled. Indeed, such conditions were expected to exist, at that time, between individuals or groups of men. In other words, a spirit of antagonism was natural instead of the get-together spirit of today. Now, however, it is safe to say that a case of this kind, becoming known in an organization, generally reaches the man higher up; and he, recognizing the true worth and value of men, starts a thorough investigation to ascertain the true facts.

Change in Disposition of Workers

Again, it is true that all classes of workers, from officials to common laborers, have changed in their disposition from that which prevailed but a short time ago. Requests such as the one set forth in this inquiry, asking for change in the work or the position of an employee, is handled with consideration. When necessary, diplomacy takes the place of the brusque and profane rejoinder formerly so commonly made to a man asking for a change.

However, there are many phases of this subject that require analysis. In his reply to the inquiry, the editor has truly stated, "It is up to the worker to earn his advancement." Frankly, I believe that a man, studying and striving to improve his condition and having an ambition to advance, should be shown just cause for being kept back when an opportunity is open to him.

In my opinion, a superintendent who could express himself in the manner this man is said to have assumed is not entitled to the position he holds. Today, it is unbelievable that a company would tolerate such treatment of their men. Consideration should be given to a faithful and efficient worker and he should be afforded every opportunity to advance in the line of his own inclination, provided he is capable.

Encourage Men to Advance

Let me suggest, here, that all workers should be instructed in regard to the importance of advancing, and the danger of falling into a possible rut. In performing work of his choice, a man will not only be more interested, but he will prove more efficient than when attending to other duties. I am referring now to a worker whose ideals are worth considering and who is trying to follow methods that will accomplish the end he has in view. Such a man needs not to wear a placard announcing his intentions, as they will be quickly detected by any up-to-date official.

I recall an instance where an excellent miner, by hard and constant work, gained the position of mine foreman, after many years of service in the same company. His success brought him an offer, a little later, and he accepted a position in another company, although his better judgment told him he was not, as yet, qualified to fill the place. In a short time, realizing that he was not handling the work with entire satisfaction, he asked for a change and his request was met with a dismissal from the company.

The man, however, I am glad to state, now holds a position with an up-to-date company where he is doing well. The incident shows the need of prudence and the exercise of good judgment in respect to the work and one's capability and ambition to advance. This man had proved efficient and worthy of the confidence of his employers, in his former position, which he should have retained.

It is my opinion that a company should never make a hard-and-fast rule in respect to the transfer of a worker from one department to another. I recall many instances where men were changed, with the result that more good was accomplished than had even been expected in making the change. Every such request from a worker should be properly considered, and fair and just treatment accorded the man. In this present instance, where it is stated the man had an experience of 12 years, working at various jobs in and around the mine, it is quite probable that he was a good subject for advancement and should have been given every opportunity to develop the best that was in him. BEN.

Thomas, W. Va.

What the Bodily Health of Workers Means to Our Industries

I HEARTILY support what John Rose has said in his letter *Coal Age*, Feb. 19, p. 364, regarding the importance of good health in obtaining the greatest success in the coal industry. The discussion of this question is vital and if conducted in the proper spirit cannot fail to be profitable to all concerned.

My belief is that all this disjointedness, contention, tumult and misery can be traced directly to a disordered state of health, in the case of a large number of workers. Indeed, the same remark will apply to social as well as industrial affairs. It should be a matter of the deepest concern to us all that so much indifference is manifest in respect to the possession of good health, whatever our position in life.

Industrial prosperity depends to such a degree on health that it is idle to discuss any question of efficiency, without due regard to those conditions that affect the health of all concerned in the undertaking in hand. This truth cannot be too strongly emphasized, since health and disease are physical conditions that affect the mind and the accomplishment of every purpose. A diseased body is very apt to be the counterpart of a diseased mind and thwarts the best intentions and loftiest aims.

Health of Workers Important

Health is to industry what the sun's heat is to all forms of life, stimulating growth and action. Healthy faculties enable us to overcome the perplexities that are ours at every turn. But in spite of all that has been written in regard to this vital force, we blindly follow our selfish inclinations and stupidly resign ourselves to conditions that encourage a morbid frame of mind, which keeps us in a constant state of uncertainty, fear and dread of the future. The result is a universal disturbance in the minds of men that is manifest in the unrest prevailing throughout the world, today.

In summing up, we are confronted with the fact that the essentials to good health are plain, wholesome food, proper clothing, pure air and comfortable sanitary living conditions. There are numerous agencies that affect the health of the miner, and these must be taken into account in considering the welfare of the coal industry. The temperament of the worker must be

regarded as a strong factor in his ability to produce. In general the miner is of a nervous temperament and readily agitated, which renders his body more susceptible to nervous disorders that seriously impede his activity and comfort.

CHANGE OF MIND NEEDED INDUSTRIALLY

My opinion is that a complete change of mind is required in respect to our industrial affairs, and this is a factor that cannot be measured in dollars and cents. It is important for the operator to remember that the mind of the worker must be imbued with sane ideas respecting his position and consequence as a productive unit. Every effort should be made to effect this transition in the worker, instead of permitting his mind to become poisoned and impressed with the false idea that he is only a machine guided and controlled solely by the will of his employer.

Allow me to say, in closing, that I am convinced that a sound and well balanced mind in every worker will make them, as a class, more efficient workers and less open to those influences that impair industrial operations. A sound mind in a sound body is, indeed, a great possession; and men thus endowed seek the best and loftiest aims, instead of striving for gain at another's expense. The latter can only cause a stagnation in the world's industries, for which there is no remedy, until all opinions become reconciled to a common truth, and brotherhood and differences are argued on a basis of reason and common sense.

Ladysmith, B. C., Canada. WILLIAM WESNEDGE.

Daily Routine of an Efficient Fireboss

IN all my firebossing, it has been my custom to examine the fan and observe the water gage, before going into the mine; then, to place a danger signal at the entrance or lock the gate so as to prevent anyone from entering the mine until the examination is finished and the report made.

It has always been my habit to start the examination at the intake end of the mine or section and follow the air current. The fireboss should enter the first working place with caution, and, lowering his flame, make a careful test for gas. He should wear no headlight, but depend wholly on his safety lamp. He should examine each place for any danger that may exist therein; see that all timbers are properly set and that there is no loose slate or coal that is liable to fall.

In making his rounds, the fireboss should note the condition of all doors, stoppings, overcasts and brattices. In each place examined he must mark the date on the roof, not more than five feet from the face of the coal, so that the workman can see plainly that his place has been inspected that morning. The examination should not be started more than three hours before the time when the men enter the mine for work. A fireboss must give particular attention to all places driven to the rise, to see that they are clear of gas. Such places are generally more difficult to ventilate.

Having completed his examination, the fireboss must make out a report and enter it in a book kept for that purpose, stating whatever dangers he may have found and giving their location. This done, he must remove the danger signal, at the mouth of the mine, in time for the men to enter for work. As a danger signal, I very much prefer the red light.

Every fireboss should run the abandoned workings, in the mine or section of the mine in his charge, at least once a week, or oftener if he thinks there is liable to be danger in such places. When making his second round of the mine, the fireboss must examine all falls and waste places and be particular to note any potholes or kettle-bottoms which are liable to fall without warning. It is also his duty to see that the required volume of air is circulating in the mine and the air current sweeping the face of the coal in every working place.

Where danger is discovered the fireboss must place a danger signal at each entrance to the place, so that no one will enter there without warning. He must see that there are no accumulations of fine dust, particularly where the coal is being mined with machines. A fireboss must know the properties and behavior of all kinds of gases found in the mine. He must be capable of making a careful test for gas and understand the proper use of the safety lamp, so as to be able to give any needed instructions to the men in his charge. He must be conscientious and faithful in the performance of his duty, as on his work depend the lives of all the men in the mine. FIREBOSS.

Roda, Va.

Height of Flame Cap as Index of Percentage of Gas

IN the issue of *Coal Age*, Mar. 25, p. 587, James Ashworth, commenting on a recent report of the Minister of Mines for the province of British Columbia, quotes the following statement as taken from that report: "It was taken for granted that a half-inch gas cap was equal to 2½ per cent of gas . . . and, checking with the Burrell gas detector, it has been proved that a quarter-inch cap in the Wolf safety lamp is equivalent to 2½ per cent of gas."

In the same report, according to Mr. Ashworth, the chief inspector of mines recommends the withdrawal of the men from the mine when the lamp shows a quarter-inch cap, indicating the presence of 2½ per cent of gas. Commenting on this statement, Mr. Ashworth says, "It is with some satisfaction that I read this recommendation from the chief inspector, which follows up my own suggestion regarding the need of more exactly defining what is understood in the reports of gas by firebosses."

Now, turning over the pages of a little booklet entitled "Mine Gases and Ventilation," by J. T. Beard, I find a diagram or table (page 90), giving the percentages of gas indicated by different heights of flame caps, in different lamps. The same table is given on page 335, in a book entitled "Mine Gases and Explosions," by the same author. The table gives the height of flame cap corresponding to 2½ per cent of gas, in an unbonneted Davy lamp, as 0.22 in. (¼ in., nearly). The same table gives, for the Wolf lamp, a flame cap of 0.72 in. (¾ in., nearly), as indicating 2½ per cent of gas, while a quarter-inch flame cap would indicate less than one per cent of gas, in the same lamp.

It would appear that there is some divergence of opinion on the question of the height of flame cap indicating the presence of 2½ per cent of gas, which the chief mine inspector recommends as the "withdrawal percentage," in the mines of the province. The Wolf lamp is the only lamp I have yet seen used by firebosses in the Canadian Northwest.

Now, I think it is safe to say that nearly all men get their knowledge of gases and the general theory of mining from textbooks. How then, let me ask, is it possible to expect firebosses to give a report of the percentage of gas found that would be exact and correctly understood. Taking the table to which I have referred as correct, the withdrawal percentage (2½ per cent) of gas would be indicated by practically a three-quarter-inch flame cap in the Wolf lamp used by the fireboss, instead of the quarter-inch cap mentioned in the report of the chief inspector.

What Should Be Standardized

Further, referring to the request of the chief inspector of mines that a limit be placed on the percentage of gas allowable in mines where blasting is permitted, as Mr. Ashworth remarks, "Few will agree with the views of the chief inspector on standardization, if it is his meaning that the provisions of Rules 1 and 2, part 11, of the Coal Mines Regulation Act, is not sufficiently explicit." He might have added, also, Rule 12, part 3, which limits the use of explosives except when the men have left the mine, to blasting in rock drifts or to the sinking of shafts where the return air passes directly out of the mine, provided inflammable gas issues so freely that a blue cap is formed in the lamp.

In this province, firebosses and shotfirers are responsible for the firing of shots and are equipped with Wolf safety lamps, a box of caps and a firing battery and cable. To my mind, it would be more to the point to standardize the safety lamp. Suppose, for example, firebosses or shotlighters were to use an unbonneted Davy lamp in one mine, while Wolf lamps were used in another mine for the same purpose.

Then, if the law established a limit to blasting, indicated by a quarter-inch cap, the use of the unbonneted Davy lamp would permit blasting when there was 2½ per cent of gas in the air, while the Wolf lamp would show the same height of flame cap when there was less than 1 per cent of gas present.

Temperature and Intensity of the Igniting Flame Proves a Factor in Explosion

Studying over this matter, I find the following reference to the explosive condition of mine air, in the booklet "Mine Gases and Ventilation," p. 90, "The Intensity of the initial impulse or the higher temperature of the igniting flame, will often cause the explosion of a gaseous mixture that would burn quietly if ignited by a less intensive source of heat energy." Attention is drawn to the rapid dissipation of heat in a burning gas greatly affecting its explosion.

Reflecting on this statement, I have wondered if the naptha flame of the Wolf lamp is a more intense source of energy than the sperm or cottonseed oil flame of the Davy lamp, and if that can be the reason of a lower percentage of gas, indicating an explosive condition in the Wolf lamp, while a like explosive condition would be shown only by a higher percentage of gas, in the use of the Davy lamp.

Most of us working in mines will be interested to know when it is safe and when it is not safe to remain in a working place when a gas cap shows on the safety lamp in use, whether this is a Wolf or a Davy lamp.

Cumberland, B. C., Canada. COAL DIGGER.

Steel vs. Wood for Mine Timbering

THE question of the growing scarcity of mine timber is becoming more acute each day, and, as the supply of timber decreases, the demand increases, which greatly increases the expense of timbering. The mines in this neighborhood require a large amount of timber for the support of the roof and, as a consequence, steel I beams, channel bars and other structural shapes of special design have come into use for supporting the roof, on main entries and other roads that must be maintained for a considerable length of time.

In my opinion, the high first-cost of steel is largely offset by the necessary expense of retimbering roads and air-courses where the roof is supported by wooden timber frames. Moreover, the use of steel for this purpose gives a greater degree of safety, as it does not lose its strength by corroding, as rapidly as wood does through decay. The average life of mine timber is from 5 to 10 years, while steel used for the same purpose will last indefinitely.

Another feature that must be considered in this connection is the fact that much timber is lost when rooms or a section of the mine is abandoned. It is my belief that a gang of three laborers headed by an experienced timberman should be kept busy, in a large mine, recovering timber from places that are abandoned. Such timber should be carefully sorted, as much of it can be used again, while the rest can be sawed into short lengths and split for cap-pieces.

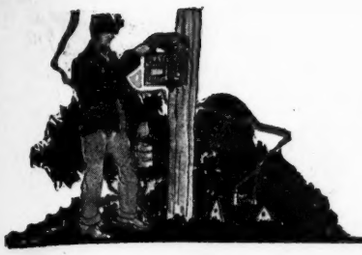
It Pays to Recover Timber in Mines

Men engaged in recovering old timber, in this way, will easily make their wages by the amount of timber saved. Also, the drawing of posts in abandoned places will have a good effect in caving the roof and thereby relieving the pressure on entry stumps and pillars. The coal mined from these pillars and stumps will be in better condition, and there will be a larger percentage of recovery, which will lower the cost of production. The work of drawing back the pillars will also be rendered less dangerous.

In my practice, I have seen millions of feet of timber practically wasted in maintaining the roof on main haulage roads where, if steel timbers had been used in the first place, this great cost of maintenance would have been eliminated. In mining low coal where headroom on the roads was limited, the use of steel rails in place of crossbars has proved a great advantage. Such timbering has lasted longer and given better support to the roof than would have been possible had wood timber frames been used. The latter would have had to be changed twice over and the roof brushed or the bottom lifted in order to give the necessary headroom. All of this was avoided in the use of the iron rails.

Another instance that came under my notice was in a mine where the wood crossbars would be broken in a few weeks and required constant changing. Later, steel I beams and rails were substituted for the wooden bars and that ended the trouble. In closing, let me say that a good crossbar is made by putting two 6-in. I beams side by side, and riveting, at each end, an angle already drilled to receive a 10-in. I beam having a plate at the top and bottom to furnish the required support.

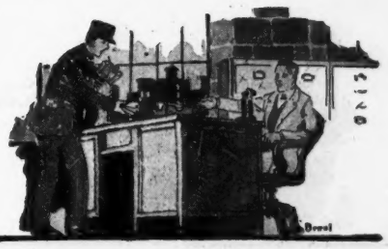
Johnstown, Pa. F. W. S.



Inquiries of General Interest

Answered by

James T. Beard

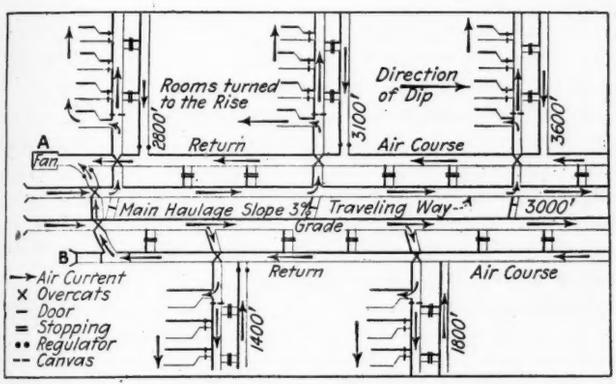


Proper and Efficient Ventilation of a Slope Mine

I am sending to *Coal Age* the plan of a slope mine opened in a seam dipping about three per cent. As shown in the plan, the slope entries are driven, four abreast, on the full dip of the seam. The gangways or levels are driven to the right and left of the slope entries, with rooms turned to the rise only. It is desired to produce 2,000 tons of coal per day of eight hours in this mine; and I want to ask how such a mine should be ventilated, using as few doors as practicable. The seam generates gas in considerable quantities, but the company has the means to supply ample ventilating power. SUPERINTENDENT.

———, Pa.

In the accompanying figure, we have reproduced the plan submitted by this correspondent, and indicated thereon the desired circulation. As the mine generates much gas it should be ventilated on the exhaust system, making the two center slope headings the intake and the two outer headings the return airways for their respective sides of the mine.



SHOWING THE REQUIRED PLAN OF VENTILATION

As shown in the figure, one of these two center entries is the main haulway of the mine, while the other serves as a travelingway. Each pair of cross-headings or levels is shown as ventilated by a separate split of air, which is conducted at once into the main return air-course and passes out of the mine. In order to avoid the use of doors, an overcast is built at the mouth of each pair of cross-headings, as indicated in the figure.

A regulator is placed at the mouth of the back entry, on each level except the last pair of headings, which present the greatest resistance. A regulator is also required at the crossover near where the return current enters the ventilating fan. The purpose of this regulator is to proportion the amount of air required on each side of the mine. Also, as indicated in the figure, a canvas is hung at the mouth of each room, except the first room, on each level, and on the gangway just inby of the mouth of that room. By this means, the air is made to circulate through the rooms and keep the working places clear of gas.

The two sides of the mine being unequally developed, doors or canvas will be required on each crossover connecting the opposite side of the mine with the main haulage road. Double doors will also be required at the mouth of the air-course on the opposite side of the mine from the fan.

Inasmuch as the mine generates much gas, it would insure greater safety to provide another fan at the mouth of the air-course, at the point marked "B," in the figure. In that case, the two fans could be operated in parallel, by the proper regulating and balancing of the air, or they could be operated alternately, one fan being always held in reserve against accident to the other. If the mine is very gaseous and much dust is present, it may be advisable to operate the two sides of the mine separately, by providing two haulage roads instead of one and building substantial stoppings in the crossovers between them.

Drift Half-Filled With Water

If a drift, in a mine, measures 6 ft. wide at the roof, 9 ft. wide at the floor and has a vertical height of 6 ft., at what depth will the water stand when the drift is half-full? In other words, how far up the timber will the water reach when the wetted area is one-half of the sectional area of the drift? W. E. WOOD.

Alverda, Pa.

In this case, the width of the entry decreases, $9 - 6 = 3$ ft., in a height of 6 ft.; or at the rate of one-half foot for each foot of height. Then, calling the depth of the water when the entry is half-full x, the width at the surface of the water will be less than the width at the floor and will be equal to $9 - x/2$. The area of the wetted section, or the cross-section of the water, being a trapezoid, is

$$\tfrac{1}{2}(9 + 9 - x/2)x = 9x - \frac{x^2}{4}$$

But, the form of the drift being also a trapezoid its sectional area is $\tfrac{1}{2}(9 + 6)6 = 45$ sq.ft. One-half of this or the wetted area, is, therefore, $22\tfrac{1}{2}$ sq.ft. Then, to find the value of x, which is the depth of the water when the entry is half-full, we write,

$$9x - \frac{x^2}{4} = 22\tfrac{1}{2}; \qquad \text{or } x^2 - 36x = -90$$

$$x^2 - 36x + 18^2 = 18^2 - 90 = 234$$

$$x - 18 = \pm\sqrt{234} = \pm 15.3$$

$$x = 18 - 15.3 = 2.7 \text{ ft.}$$

Therefore, the depth of the water when the entry is half-full of water is 2.7 ft.

Examination Questions

Answered by

James T. Beard

Bituminous (17th Dist., Pa.) Mine Foremen's Examination, April 6, 1920

(Second Grade, Selected Questions)

Ques.—As a mine foreman, how would you provide for the health and safety of persons employed in and about the bituminous coal mines of this state and for the protection of the property connected therewith?

Ans.—The first duty of the mine foreman is to see that the mine in his charge is operated in accordance with the requirements of the Bituminous Mine Law, giving particular attention to the quantity of air in circulation and its distribution in the mine; the frequent and thorough examination of the mine and inspection of each working place while the men are at work; the supply of timber of the required size and type; the prompt and proper timbering of each working place and of all roads, airways and travelingways; the safe use of explosives and the drilling, charging and firing of all shots; and, lastly, the maintenance of strict discipline in the mine and compliance with all mine regulations for health and safety.

Ques.—Give your reasons why mechanical ventilation is superior to furnace ventilation.

Ans.—Furnace ventilation cannot be employed with safety where a mine is generating gas. Moreover, mechanical ventilation, by means of an approved type of ventilating fan, is under better control at all times. Particularly is this true where there is no nightshift employed in the mines and the furnace cannot, therefore, receive the same attention after the daymen have left the mine, or during periods of idleness when the mine is not running. In case of an explosion or other accident occurring in a mine ventilated by a furnace, the only means of ventilation may be entirely shut off and rendered useless for the time. On the other hand, a good fan located on the surface is always available and under control.

Ques.—What dangers may arise from coal dust, in a dry and dusty mine, and what precautions would you take to guard against them?

Ans.—In a dry and dusty mine, the fine dust is thrown into the air by the daily operations performed in the mine, and accumulates, not only on the roads and in the passageways where it lodges on the timbers, roof, floor and sides of the entry, but also in considerable quantities at the working faces, especially if machines are used for cutting the coal. The presence of the dust in the mine air increases the explosive condition of the air, and is particularly dangerous where a small percentage of gas is present.

To guard against these dangers it may be necessary to install an efficient spraying or sprinkling system on the roads and travelingways. Strict regulations should be made and enforced in regard to blasting; and it is advisable that all shotholes should be inspected, charged, tamped and the shots fired by competent shotfirers, after the men have left the mine. Every precaution should be taken to avoid undue accumulations of dust at the working faces and on all roads, airways and passageways in the mine. Particular attention must be given to reduce the danger of dust in pillar workings.

Ques.—What precautions would you take to guard against danger from the following causes: (a) Falls of roof, slate, coal and sides; (b) cars, motors and machinery; (c) use of dynamite and fuse in blasting?

Ans.—(a) All roads, airways and travelingways in the mine should be well timbered by competent men. A systematic method of timbering should be adopted in the working places, which should be inspected, at regular short intervals, by the mine foreman or his assistants, while the men are at work. Where the coal is undercut by hand or by machine, the mining should be carefully spragged. All miners should be instructed to reset any timbers that may have been discharged by a shot, before proceeding to do other work in the place.

(b) All rolling stock and haulage equipment of every kind should be carefully inspected, at frequent intervals, and any needed repairs promptly made. The same is true of all machines and appliances of any kind employed in and about the mine. All roads, tracking and switches should be kept in good repair. The track should be well ballasted; competent motormen should be employed; and strict regulations should be enforced to prevent men from riding on loaded cars or trips when going to and from their work.

Separate travelingways must be provided so that men will not be obliged to travel the haulage road, on their way in and out of the mine. Where this is impracticable, a good clearance space should be provided on one side of the road to allow men and animals to pass the cars without danger. Also, refuge holes must be provided at frequent short intervals, except where rooms are turned off the entry, which would serve the same purpose. All refuge holes must be whitewashed and kept free from obstructions of every kind. Finally, suitable regulations should be made in regard to the movement of all cars and trips. No cars must be left standing in the mouths of rooms, or on sidetracks, without being carefully blocked to prevent their running out onto the main track.

(c) The grade of dynamite in use in a mine should be adapted to the work in hand, and the charging, tamping and firing of the holes should be performed by competent men. No one should be permitted to use a short fuse or to crimp the cap on the end of the fuse with his teeth. No dynamite should be used in the same hole with black powder. A safe method of transporting the dynamite in the mine and distributing it to the workmen should be adopted. Care should be taken that the explosive is not frozen before being fired. If frozen, it must be thawed in a proper manner on the surface, before being carried into the mine.

NEWS FROM THE CAPITOL

BY PAUL WOOTON

Ask Commerce Commission to Forbid Preference in Car Supply

ACCORDING to a statement signed by nearly one hundred members of the House of Representatives railroads operating in the coal-producing districts of the Middle West are interpreting recent emergency orders of the Interstate Commerce Commission in a manner which leads to serious discrimination against coal supply to the public.

A committee including Representative Israel M. Foster, Republican, of Ohio; William Green, secretary of the United Mine Workers of America, and John Moore, president of the Ohio district of the same organization, arranged to present the statement before the Interstate Commerce Commission.

The commission is requested in the statement to put in force sections of the Transportation Act which particularly forbid any preference in the supply of coal cars.

"Unless the practices are stopped and something is done to remedy the situation we will have next winter a coal shortage as bad as that of 1917," Representative Foster asserted. "The railroads, which consume about 30 per cent of all the coal mined, are moving cars in a fashion which gets only that 30 per cent mined."

Miners are joining in the plea, according to the statement of their representatives, because the failure to furnish cars has closed down many mines and left them out of employment.

Michigan Petition for Priority on Coal Not Likely To Be Heeded

THE Michigan public utilities have petitioned the Interstate Commerce Commission for a priority on coal from mines on the Chesapeake & Ohio, Baltimore & Ohio, Louisville & Nashville, Norfolk & Western, Hocking Valley, Pittsburgh & Lake Erie, Kanawha & Michigan and Pennsylvania railroads, and state in their petition, "That if in the judgment of the Interstate Commerce Commission the coal mine operators of the country are in any degree to blame for the present shortage of coal and if in the opinion of said commission the coal mine operators and owners are profiteering to the injury of the public, then and in such case said Interstate Commerce Commission recommend to the Congress of this United States the enactment of such legislation as may be necessary in order that the coal consuming public of Michigan and every other state may purchase the coal it absolutely needs at reasonable prices."

It is pointed out that this is exactly what the Fuel Administration did early in its existence and that it resulted in a very serious situation which required months to undo. In view of that recent lesson it is not believed that the Interstate Commerce Commission will start assigning cars to any particular consumers.

Bituminous Commission and Industrial Cabinet Favor Zoning System

PRESIDENT Wilson's Bituminous Coal Commission apparently did not conclude its activities with the submission of its recent award. It is understood that the commission continues to advise what is known as the "industrial cabinet," which consists of the six secretaries who form the United States Council of National Defense. These are the Secretaries of War, Navy, Interior, Agriculture, Commerce and Labor. Just at this time these secretaries are taking a very active interest in the coal situation.

It is known that pressure is being brought to bear for a return to the zoning system for coal transportation. Some are of the opinion that a considerable saving of open-top equipment can be effected by this plan. There is little reason to believe, however, that any effort will be made to restore the zones, because it is believed that an injunction could be obtained almost immediately to prevent such an order going into effect.

Uncertainty Felt Regarding Committee Action on Frelinghuysen Bill

MUCH indefiniteness surrounds the probable action of the Committee on Interstate Commerce of the Senate on the Frelinghuysen bill. Senator Townsend of Michigan is the temporary chairman of the committee. It is understood that he has been appealed to by certain members of the committee to defer action on the bill until after the convention recess. On the other hand he is being urged by Senator Frelinghuysen to consider the bill and call for a vote at the earliest possible moment. It is practically certain that a majority of the committee will vote for the bill, but it is not improbable that Northwestern Senators will insist upon certain changes in the bill, which may be agreed to.

Dr. Cottrell Will Address American Iron and Steel Institute

DR. F. G. COTTRELL, who will become director of the Bureau of Mines June 1, has just completed an inspection visit to the helium laboratory at Petrolia, Texas. He addressed the Chicago chapter of the American Chemical Society on "International Scientific Relations" on May 21. He will address the American Iron and Steel Institute at its New York meeting May 28.

Evictions in Williamson-Thacker Field End in Eleven Killed

Attempts to Extend Union Into Mingo County Result in Shooting Affray—Stories Conflict—Union Claims That It Has 3,000 Members in Thirteen Locals

ALLEGED attempts to check the progress of the union in Mingo County, West Virginia, by evicting the leaders of the newly-formed organization are said to have been the cause of a pitched battle on May 19 which resulted in the death of eleven men—seven detectives, the mayor of the village of Matewan, a union organizer, a miner and a boy. The detectives were driven off, some taking to the Tug River, which flows past the village, and some hiding in the country nearby.

Many are the stories told and only an investigation will reveal the true facts, if indeed the truth is ever known. Lynn, where the shooting fray occurred, lies three miles from Matewan, twelve miles southeast of Williamson, along the line of the Norfolk & Western R.R. and the Tug fork of the Big Sandy, or Tug River, the railroad crossing the river into Kentucky for a short distance at Matewan.

The union has been trying to get a foothold in Mingo County and it had secured at least a toehold at the mine of the Stone Mountain Coal Co. Apparently that corporation determined to prevent further unionization of its mine by the eviction of the union men and Baldwin-Felts detectives were introduced. According to reports, eight families were evicted.

At Least Two Stories of Shooting Are Told

The detectives, having completed their work, are said to have been waiting for the train when the mayor, Cabell Testerman, approached Albert Felts, the leader of the detectives, and demanded to know by what authority the detectives had acted and who empowered them to take one of the mine workers prisoner. This report declares that Felts shot the mayor from his coat pocket and that Felts in his turn was killed by "Sid" Hadfield, the chief of police of Matewan, and that then the shooting became general.

Another story is to the effect that Robert Mullens demanded of Albert Felts whether he had a warrant for his (Mullens') arrest. When Felts declared that he had and started to read the warrant he was cut short by a shot fired by Mullens. Mullens, in his turn, it is said, was killed by J. M. Ferguson, a detective, who was himself shot by an unidentified mine worker.

Whatsoever the originating cause, a fight to the death followed, the upshot of the shooting, first and last, being the deaths of Cabell Testerman, the mayor; Albert Felts, L. C. Felts, E. O. Powell, A. J. Booker, J. M. Ferguson, L. N. Brown and C. B. Cunningham, detectives; Robert Mullens, a union organizer; William Rohrer, a miner, and Patrick Kinsley, a boy of 17 years of age.

From other sources the statement comes that Robert Mullens was a local preacher, serving the spiritual needs of the mountaineers and miners, and that so far from being a labor organizer and the man who fired the first shot he was an innocent bystander. His office of local preacher, however, would not make it impossible for him to be a moving spirit in the union, as earlier reports state, but rather furnish him with an opportunity to carry on his labors without interruption.

The Baldwin-Felts organization is a well known detective agency which has been active in many such labor troubles, especially in West Virginia. At the congressional investigation in 1914 Felts testified that he had been employed by coal operators for four years and had brought a machine gun from West Virginia to be used for the defense of those miners in the southern Colorado mines who desired to continue at work through the long strike.

After the affray Sheriff Blankenship commissioned 100 deputy sheriffs to guard the streets and sent word to Charleston that the state constabulary was needed to maintain order, and Col. Jackson Arnold, superintendent of the Department of Public Safety of West Virginia, assembled his entire force, which was scattered all over the state. All the men will be used to keep order in Mingo County if conditions indicate that the full force is needed. Company B left Nitro for Matewan under command of Sergeant Harvey N. Rexroad, formerly an army captain.

Secretary-Treasurer Fred S. Mooney of the United Mine Workers of America, District 17, declares that the union has thirteen or fourteen locals in Mingo County and a membership of 3,000.

"This terrible affair may prove a blessing in disguise," commented Mr. Mooney. "I firmly believe that it will mark the beginning of the end of thug rule in some of the mining counties.

"When coal companies were serving their notices, Sheriff Blankenship called together the miners who had been organized and inquired whom they preferred as the instruments of their eviction—the sheriff's office or the detectives. The workers assured the sheriff that they would interpose no obstacle to the execution of the law by Sheriff Blankenship.

"The sheriff then told the miners that he would protect them from unlawful acts of the detective agency. In making his word good, he ordered the arrest, on due complaint, I believe, of twenty-seven of the detectives for arbitrarily evicting workers in advance of the trial of their cases in court."

Bids for Supply of Navy Coal Are Still Inadequate

ACTING Secretary of the Navy Roosevelt announces that on May 18 at the opening of bids for coal under schedules Nos. 5459, 5460 and 5461 seven proposals were received, aggregating a total of 319,000 tons of bituminous coal and 3,700 tons of anthracite coal. The annual requirements, as stated in the proposals, are 2,174,800 tons of bituminous coal and 38,215 tons of anthracite coal.

At the principal point of delivery—Hampton Roads, Va.,—there was offered 185,000 tons of the 1,200,000 tons called for. The prices in the bids submitted range from $4.20 to $4.816 per gross ton f.o.b. mines. The lowest price quoted, which is on 40,000 tons, is $0.168 per ton less than the lowest price received for the same form of delivery under an opening of bids held April 6, 1920.

The base price at present being paid by the Navy under commandeering orders for coal taken at Hampton Roads is, including allowance for the advance in wages of April 1, about $3.70 per gross ton.

Trade Commission Publishes Bituminous Coal Production Costs for February

Increase of Ten Cents Per Ton in Mine Cost Caused a Decrease of Operators' Margin — Commission States That Decision in the Maynard Case Has Had Little Effect on the Number of Operators Submitting Reports

DESPITE the victory of the National Coal Association in the Maynard case and its advice to members that they need not file reports, the Federal Trade Commission advises that no important percentage of operators have discontinued sending in the reports. It is also stated at the commission that the number of companies declining to send reports is decreasing.

The commission on May 24 issued the second of its bituminous coal bulletins, furnishing current information on the cost of production. In connection with its second bulletin the commission, among other things, states:

"The commission has collected considerable information on the investment necessary for operation in the various districts, in part derived from balance sheets required from operators and in part from information previously reported by them or obtained direct from their books. When such investment figures are available it then will be possible, after deduction of any sales expense and income and excess profits taxes paid, to show the relation which the remainder of the margin bears to the investment."

In the following tables are shown for the principal regions the claimed costs, sales realizations and margins of the 1,431 operators from whom complete reports for February, 1920, have thus far been received. With these costs are also shown the costs (revised by the commission), sales realizations and margins of the 2,482 operators from whom reports were received for the entire twelve months of 1918. The 1,431 operators had a production of 18,133,477 tons of commercial coal during February, 1920, and the 2,482 operators mined 497,416,437 tons of commercial coal during 1918 (an average of 41,451,370 tons monthly). Detailed figures for each of the 74 districts and 24 States will be found in Table 5 at the end of this bulletin.

The relative change in the situation between January and February, 1920, is shown in Table II herewith, where figures for 1,372 operators are given. The increase of 10 cents per ton in the average claimed f. o. b. mine cost is primarily attributed to the decrease in output, since there was no general increase in the rate of wages paid in February over that paid in January. The table also shows the percentage which the time actually worked formed of the possible full working time each month, which in the case of January was taken as 26 days and in the case of February, 23 days. The average production per day of possible full working time for the 1,372 operators was 801,846 tons in January and 766,354 tons in February, a decrease for February of 4 per cent.

TABLE I. FEBRUARY, 1920, SALES REALIZATIONS AND CLAIMED COSTS OF 1,431 OPERATORS AND SALES REALIZATIONS AND REVISED COSTS OF 2,482 OPERATORS FOR THE YEAR 1918, BY GENERAL COMPETITIVE REGIONS

	February, 1920							Year, 1918						
			Claimed Costs per Ton							Revised Costs per Ton				
General Competitive Regions	No. of Operators	Sales Realization per Ton	Labor	Supplies	General Expense	Total F.O.B. Mine	Margin per Ton	No. of Operators	Sales Realization, per Ton	Labor	Supplies	General Expense	Total F.O.B. Mine	Margin per Ton
Central Competitive "Interstate"[1]	421	$2.45	$1.60	$0.27	$0.30	$2.17	$0.28	765	$2.45	$1.39	$0.25	$0.26	$1.90	$0.55
Eastern Adjacent [2]	458	2.79	1.73	.28	.45	2.46	.33	966	2.81	1.45	.28	.32	2.05	.76
Western Adjacent [3]	82	2.87	1.94	.24	.34	2.52	.35	138	2.75	1.75	.26	.26	2.27	.48
Southern Appalachian [4]	223	3.03	2.00	.34	.47	2.81	.22	288	2.81	1.61	.29	.36	2.26	.55
Southwestern "Interstate"[5]	145	3.42	2.52	.26	.44	3.22	.20	171	3.13	2.15	.25	.34	2.74	.39
Rocky Mountain [6]	102	2.97	1.89	.29	.38	2.56	.41	154	2.73	1.63	.26	.30	2.19	.54
United States	1,431	$2.74	$1.78	$0.28	$0.37	$2.43	$0.31	2,482	$2.65	$1.49	$0.26	$0.29	$2.04	$0.61

[1] Includes all of Illinois, Indiana, Ohio and the southwest district of Pennsylvania.
[2] Includes all of Maryland, West Virginia, Virginia and the central district of Pennsylvania.
[3] Includes all of Michigan, Iowa and district No. 1 of Kentucky.
[4] Includes all of Alabama, Tennessee and districts Nos. 2, 3 and 4 of Kentucky.
[5] Includes all of Missouri, Kansas, Arkansas, Oklahoma and Texas.
[6] Includes all of Colorado, New Mexico, North Dakota, Montana, Wyoming, Utah and Washington.

TABLE II. JANUARY AND FEBRUARY, 1920, SALES REALIZATIONS AND CLAIMED F.O.B. MINE COSTS PER TON OF 1,372 IDENTICAL OPERATORS, BY GENERAL COMPETITIVE REGIONS.

	January, 1920						February, 1920						
General Competitive Regions	No. of operators	Production, Tons	Per Cent of Time Worked	Sales Realization	Claimed f.o.b. Mine Cost	Margin	Production, Tons	Per Cent of Time Worked	Sales Realization	Claimed f.o.b. Mine Cost	Margin	Increase of claimed cost, Feb. over Jan.	Decrease in output per day in Feb. from Jan.
Central competitive "Interstate"	405	9,150,136	73	$2.43	$2.11	$0.32	7,945,061	70	$2.46	$2.18	$0.28	$0.07 3%	2%
Eastern adjacent	445	4,449,221	69	2.80	2.34	0.46	3,637,596	65	2.81	2.46	0.35	0.12 5	8
Western adjacent	79	1,170,787	79	2.82	2.33	0.49	930,709	78	2.83	2.50	0.33	0.17 7	10
Southern Appalachian	203	2,408,501	73	3.03	2.69	0.34	2,031,386	72	3.02	2.81	0.21	0.12 4	5
Southwestern "Interstate"	140	1,161,002	81	3.49	3.05	0.44	937,552	74	3.41	3.21	0.20	0.16 5	9
Rocky Mountain	95	2,508,352	92	3.07	2.48	0.59	2,134,829	91	2.98	2.56	0.42	0.08 3	4
United States	1,372	20,847,999	73	2.75	2.33	0.42	17,626,133	69	2.74	2.43	0.31	0.10 4	4

The increase of 10c. per ton in the average claimed f. o. b. mine cost of the 1,372 operators together with the decrease of 1c. per ton in their average sales realization resulted in an 11c. decrease in their margin for February as compared with January.

There is a general correspondence between the decrease in percentage of time worked and the decrease in output per working day. The closeness of this correspondence, however, is modified by changes in the number of men actually at work from day to day.

Continuing, the report says that, as compared with the year 1913, the average sales realization of the 1,090 identical operators in another table was 13c. higher in January, 1920, and 12c. higher in February. Their average claimed cost, however, was 23c. higher in January and 33c. higher in February. As a result their average margin, which was 61c. per ton in 1918, fell to 43c. in January and to 32c. in February. The average increase of claimed f. o. b. mine cost for January, 1920, was 11 per cent over that for the year 1918, and for February was 16 per cent. This increase is attributable to two chief causes: (1) the higher wage scale put into effect in November, 1919, as a result of the Food Administrator's recommendation of 14 per cent increase in the wages of mining labor, and (2) the decrease in the monthly production for February, 1920, from the average monthly production of 1918.

Morrow Refutes Profiteering Charges Made by Lauck and Senator Walsh

Vice President of National Coal Association Shows Unfairness of Selecting a Few Fortunate Operators as Typical—Critics in Citing Prices, He States, Ignore Operating Expenses, Fixed Charges and Taxes

PROFITS of coal operators again was the subject of discussion in Washington last week. In addition to the allegations made by W. Jett Lauck before the Railroad Labor Board, Senator Walsh of Massachusetts charged, on the floor of the Senate, that huge profits had been made by coal operators. This led J. D. A. Morrow, vice-president of the National Coal Association, to issue an open letter to the Massachusetts Senator, in which he attempts to refute the charges made.

Senator Walsh's remarks as to coal profiteering were as follows:

"The income-tax data compiled for the Senate by the Treasury Department showed profits for the bituminous mine operators out of all proportion to the increased wages of miners. Of the 392 bituminous coal companies cited, 334 showed net profits, after every possible deduction, of over 25 per cent. More than half the companies—218 to be exact—showed earnings of over 50 per cent on capital stock. And 118, or nearly one-third of all, showed net profits of over 100 per cent.

"The financial manuals show that the net incomes of seventeen of these companies increased from $13,000,000 in 1914 to $48,000,000 in 1917, and their average net profit per ton from 20 to 60c. If the average profit per ton of these companies was representative of the whole industry, then the bituminous mine operators of the United States during the four years 1916, 1917, 1918, and 1919 gathered a total profit of more than $1,000,000,000, of which more than two-thirds was excess.

"The anthracite coal operators show still larger percentages of net profits. The average prewar incomes of four of the larger companies were $7,000,000, which was 15 per cent on the capital stock. In 1917 this average had risen to $16,000,000, or over 34 per cent on the capital stock. The income-tax returns show that the net income of six smaller companies, which was already 57 per cent in 1916, increased to 94½ per cent in 1917.

"The statistics presented to the Railroad Labor Board by the railroad brotherhoods tend to show how these huge profits were obtained.

"In 1914 the average cost of anthracite coal at the mine was $2.28 per ton, of which $1.59 was paid for labor. Transportation to New York cost $1.80 per ton, and the retail price was $7.54, leaving margins totaling $3.46 for the operator, the sales corporation and the retail dealer. In December, 1918, the cost at the mine was $4.22, for which $2.97 went to labor. Transportation had risen to $2.30, and the retail price to $11.82, leaving $4.80 for the distributor's margin. Thus the retail price increased three times as much as the increase in miners' wages."

In his open letter to Senator Walsh, Mr. Morrow says:

"I have read your speech on profiteering with much interest, but I am constrained to deny your statements concerning the profits of the bituminous coal industry. To my mind it is necessary to refute the indiscriminate charge that the bituminous coal industry made preposterous profits during the war. Let me, therefore, direct your attention to official figures on this subject which you have either overlooked or disregarded.

"You cite Mr. McAdoo's report on corporate earnings printed as Senate document No. 259 as your chief authority. The unfairness of that report is notorious. Mr. McAdoo's letter of transmittal itself states that he selected only companies which in 1917 earned 15 per cent or more on their capital stock. In 1917 there were about seven thousand separate coal producers. His report, therefore, covers only about 6 per cent of the total number. It includes only the fortunate 392 who, because of specially favorable mining conditions, with low production costs compared with selling prices, or on account of merely nominal capitalization, made 15 per cent or more on their capital stock. It says nothing of the other 94 per cent, some 6,600 operators, who admittedly made less than 15 per cent. Even the percentages quoted for the 392 concerns are no true measure of profits, because they are based on capital stock, when the report itself shows that many of these companies had invested far more than their capitalization. Consequently, any such conclusions as yours, based on that report, are manifestly unfair and misleading.

"Further, with regard to alleged huge profits in 1917, the United States Geological Survey report on coal pro-

duction for 1917, page 958, shows that the total output of bituminous coal in 1917 was sold by the operators at an average price of only $2.26 per ton at the mines, out of which all operating expenses, fixed charges and taxes had to be paid before any profit remained.

"Throughout 1918 prices were under control of the Government. On Nov. 19, 1919, Dr. Garfield, United States Fuel Administrator, stated publicly that the average price allowed the bituminous operators for 1918 was only $2.61 per ton. He stated further that this permitted them an average margin of 46c per ton. Dr. Garfield was careful to explain that out of this margin Federal taxes of 30c per ton and some other deductions had to be made before the operators had any profits. Let me refer you also to the report of the United States Bituminous Coal Commission, page 41, where the tax returns to the Treasury of some 1,551 bituminous coal mining concerns are tabulated for 1918.

"These companies produce about one-third of the total output of bituminous coal, and after examination of the companies included, the United States Geological Survey advised the commission that these companies represented fairly the conditions throughout the industry. Please observe that 337 of the 1,551 operators reported losses and that after deducting taxes the average per cent of net income to invested capital for the 1,214 companies reporting profits was less than 11 per cent, and for the entire number of 1,551 companies, was only 9.72 per cent.

"In this connection I trust you will remember that coal mining is a hazardous business and cannot be judged by the standards of return which are properly applicable to safer enterprises. At the outset the operator must invest in hundreds of acres of coal land, parts of which may afterward turn out to be unworkable. He must sink his money in miles of underground tunnels and install expensive machinery far below the surface, all of which investment is subject to rapid destruction or total loss by explosions, fires, falls of slate, sulphurous mine water and other physical conditions. At any time he may encounter irregularities in the coal deposits which will run his mining costs up to prohibitive figures. No 6 per cent or 8 per cent return is adequate for capital which must encounter such risks.

"As for 1919, the evidence obtained by Senator Frelinghuysen's sub-committee of the Senate which has been inquiring into coal conditions since last August shows that, following the lifting of Fuel Administration control, prices under competition in the open market sank to less than the Fuel Administration maximum limits. The only exceptions to this general downward price movement were certain high grade coals of special value which have always commanded a premium in the open market. At the same time, on account of the additional increase in the cost of material and on account of greater lost time, mining costs advanced. It is common knowledge that in 1919 profits were less than in 1918.

"The Federal Trade Commission has recently issued two reports on costs and selling prices of bituminous coal, showing that the operators' margins in January and February, 1920, were only about half the 'margins' of 1918. The reports state that the 'margins' shown are not profit, because selling expenses, interest on investment and Federal taxes still remain to be deducted.

"The sale of a few cars of coal at high prices may be heralded broadcast as evidencing the general level of bituminous-coal prices. Nothing is ever said of the millions of tons moving currently at low prices. Some bituminous coal is doubtless being sold today at relatively high prices, but under present operating conditions high prices are inevitable.

"An acute transportation shortage, rendering mine operation very irregular and costly, has been accentuated by unfair discrimination in the distribution of empty coal cars to the mines. Under special authorization from the Interstate Commerce Commission and in the face of the most vigorous protests from the bituminous coal operators, the railroads are giving a full supply of cars to those mines supplying their locomotives with coal and are running these mines six days per week. They are scattering the remaining handful of cars among the other mines which supply the public utilities, the industrial plants and the domestic consumers of the country.

"Hundreds of mines thus discriminated against are prevented from shipping coal on more than four or five days per month, but all the expense of maintaining these mines goes on just the same. Some of them normally hoist ten, fifteen and twenty tons of water daily for every ton of coal produced. This water must be pumped regardless of whether coal is being shipped or not. The workings must be kept ventilated, tracks cleaned of falls of slate and rock and the property maintained. Such irregular operating conditions in the last few weeks have increased production costs at hundreds of mines from $1 to $3 per ton. Thus, at the same time that this system of discriminatory car distribution is depriving the industrial consumer and ordinary householder of his coal it is doubling the cost of producing the little tonnage which is available for him.

"There can be no permanent improvement of social conditions in America proceeding from misinformation and misunderstanding of the elemental facts. I am satisfied that you are sincere in your desire for constructive betterment and therefore I am taking the time to bring this information to your attention. We shall be glad at any time to give you or any other public official the facts on conditions in this industry.

"Since your speech has been so widely quoted, I deem it only fair to make this letter public."

Pittsburgh Wage Contract Signed at Last

AFTER a delay of weeks the Pittsburgh wage contract is signed, the difficulty regarding house rents being settled to the satisfaction of the mine workers. The rent clause reads:

"It is agreed that house rents shall remain as they are during the life of this agreement, except as to houses completed after April 1, 1920, it being distinctly understood that operators will be privileged to charge a reasonable rent for the same."

It will be observed that the clause sets forth very clearly what is indeed a fact, that the rent on houses completed before April 1, 1920, is less than what is reasonable. In fact mine houses are no longer a source of profit but of loss to their owner. They are built merely because without them men cannot be obtained, and with no men it is impossible to mine coal. The date of the signature of the contract is May 18, but it is operative as from April 1.

President Wilson Forbids Strike of Men in Anthracite Mines

Will Appoint Commission to Consider Wage Increase—Urges the Ill Effects to National Prosperity of a Strike at This Time

ON May 22 President Wilson issued an ultimatum to the anthracite miners and operators through Mr. Gorman, the secretary of the Joint Scale Commission, advising both sides that, if it appears necessary, he will appoint a body similar to the Bituminous Coal Commission to take up the whole subject and demanding that the miners await its decision before going on strike. The President's letter ran as follows:

"I have watched with more than passing interest your efforts to negotiate a new wage scale for the anthracite coal fields. The arrangement to continue work at the mines after April 1, pending the adoption of a new agreement which you entered into when the previous wage scale was about to expire, was highly commendable and filled us all with hope that a new contract would be mutually worked out and the supply of anthracite coal continued without interruption.

"I have, however, been advised that there is a possibility you may not come to an agreement. I am sure I need not remaind you that we have not yet recovered from the economic losses incident to the war. We need the fullest productivity to our people to restore and maintain their own economic standards and to assist in the rehabilitation of Europe.

"A strike at any time in a great basic industry like anthracite coal mining would be a very disturbing factor in our lives and industries. To have one take place now, while we are actively engaged in the problems of reconstruction, would be a serious disaster.

"I am not familiar with the technical problems affecting the making of your wage scale. You are. You should therefore be able to effect an agreement. If for any reason you are unable to do so, I shall insist that the matters in dispute be submitted to the determination of a commission to be appointed by me, the award of the commission to be retroactive to April 1, in accordance with the arrangement you have already entered into, and that work be continued at the mines pending the decision of the commission. I shall hold myself in readiness to appoint a commission similarly constituted to the one which I recently appointed in connection with the bituminous coal mining industry as soon as I learn that both sides have signified their willingness to continue at work and abide by its decision."

Interstate Commerce Commission Acts To End Freight Tie-up

IN an effort to relieve the nationwide freight congestion and car shortage, the Interstate Commerce Commission on May 20 issued to the railroads of the country three orders relating to the hauling of freight.

Service order No. 1 suspends all rules and regulations as to car service and directs the carriers to forward traffic by the most available routes without regard to the routing thereof made by shippers or by carriers or to the ownership of cars.

Service order No. 2 suspends all car service rules and orders the relocation of open-top cars from Western territory to Eastern territory, naming the number of cars which each carrier must send east each day. This order relates to the roads operating west of Chicago.

Service order No. 3 is similar to order No. 2, except that it applies to Eastern roads and orders the relocation of box cars from Eastern and Southeastern territory to Western territory. The order stipulates the number of cars daily that must be moved.

The second order is of most interest to the coal trade, inasmuch as it orders a number of important carriers, located principally west of the Mississippi River, to turn over a specified number of open-top cars daily to their Eastern connections. This should have the effect of increasing the coal-car supply. The reciprocal part of this arrangement is service order No. 3, which requires Eastern and Southeastern carriers to turn over to the Western lines daily a specified number of box cars.

Order No. 1 also provides for the charging of the rate of freight applicable over the route indicated in the bill of lading or shipping instructions, regardless of the fact that a higher or lower rate may be applicable via the route over which the shipment actually moves.

Service order No. 1 in full is as follows:

The subject of route of freight traffic being under consideration, and it appearing, in the opinion of the commission, that, because of shortage of equipment and congestion of traffic, an emergency exists on the lines of all carriers by railroad in the United States subject to the Interstate Commerce Act, which requires immediate action,

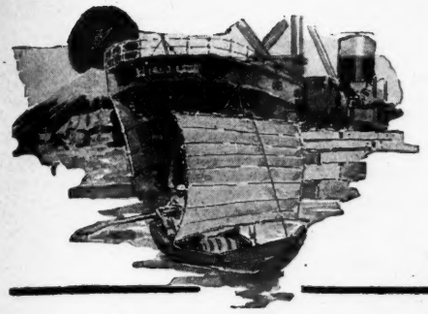
It is ordered that until the further order or direction of this commission all said common carriers by railroad are hereby directed to forward traffic to destination by the routes most available to expedite its movement and relieve said congestion, without regard to the routing thereof made by shippers or by carriers from which the traffic is received, or to the ownership of the cars, and that all rules, regulations and practices of said carriers with respect to car service are hereby suspended and superseded in so far only as conflicting with the directions hereby made.

It is further ordered and directed that inasmuch as such disregard of routing is deemed to be due to carriers' disability, the rates applicable to traffic so forwarded by routes other than those designated by shippers, or by carriers from which the traffic is received, shall be the rates which were applicable at date of shipment over the routes so designated.

It is further ordered and directed that in each instance where the traffic is routed or rerouted by carriers by railroad under the authority of this order the carrier responsible for such routing or rerouting shall within twenty-four hours thereafter deposit in the United States mail a notice addressed to the consignee of the traffic stating the car numbers and initials, places and dates of shipment, the routing and respective routes over which the traffic is moving, and that charges for the transportation of the traffic, including transportation, and schedules of rates, fares and charges, as those terms are defined in said act, will be the same as they would have been if such routing or rerouting had not taken place.

It is further ordered and directed that in executing the directions of the commission contained in this order the common carriers involved shall proceed without reference to contracts, agreements or arrangements now existing between them with reference to the divisions of the rate of transportation applicable to said traffic; that such divisions shall be, during the time this order remains in force, voluntarily agreed upon by and between said carriers, and that upon failure of the carriers to so agree, said divisions shall be hereafter fixed by the commission in accordance with pertinent authority conferred upon it by said act.

And it is further ordered that copies of this order and direction be served upon all carriers by railroad in the United States subject to the Interstate Commerce Act, and that notice of this order be given to the general public by depositing a copy of the order in the office of the secretary of the commission, at Washington, D. C.



Foreign Markets and Export News

Increase Ruhr Miners' Wages

In the Ruhr coal fields, according to *The Colliery Guardian*, an arrangement has been concluded under which, with the presumption that the price of coal will be raised to correspond, all underground workers above twenty years of age are to receive an increase of 5.50 mk. per shift from April 1, the basis price for contract workers also being advanced by 5.50 mk. Surface workers are to be paid another 90 pf. per hour. All under twenty will receive increases in proportion to their age, on the same basis of calculation.

Alabama Coal Goes to France and Italy

Seven thousand tons of high-grade Cahaba vein coal, the *Age-Herald* (Birmingham, Ala.) states, left the port of Pensacola recently for Italy, and similar movements are to take place through that port about twice a month. Much more would move at this time but for the car shortage. France is also a taker of Alabama coal in quantities that are limited principally by car shortage.

The rate to Pensacola is $1.60 per ton, while the ocean rate to Europe is from $16 to $20 per ton. Even at this high cost, Italy and France, especially Italy, must have coal. An agency in touch with this business declares that contracts for 500,000 tons for Italy could be booked any day if there were facilities for moving that amount in the time desired.

At this time last year there were few ships in Southern waters. Now, owing to allocations by the emergency fleet corporation, there is a supply ample apparently for all current needs, but the car shortage prevents full utilization of this ocean-going transportation capacity. An expert declares that the present car shortage, as it affects the Alabama coal mines, is at least 30 per cent. Under these circumstances, and with the domestic consumer clamoring for far more than the present coal production, the export demand cannot be cared for in the measure which the operators would desire.

Both the Louisville and Nashville and the Georgia, Florida and Alabama have coal tipples at Pensacola for placing the coal on ships.

What Birmingham coal operators especially desire, and are now working hard for, is ample coal terminals at Mobile, which would prove a double advantage, because the 20 per cent rail differential for shipment down the Warrior would also be available.

Not long ago an Alabama coal company turned down a firm offer of contract for several hundred thousand tons of high-grade Alabama coal for Italy on account of lack of handling devices at Mobile.

The matter of having the government build a coal terminal with 25,000 tons capacity at Mobile, interest on the investment to be guaranteed by the Alabama coal operators, has received strong backing, but no final decision has been rendered by the authorities.

Coal Shipped Through Panama Canal During March

Shipments of coal through the Panama Canal during March totaled 3,336 tons, while the coke carried through amounted to 4,360 tons.

Coal Exported from New York During March

Exports of coal and coke through the Port of New York during March of this year total 16,368 tons valued at $153,609, as compared with $16,664 in 1919, $61,721 in 1918, and $132,579 in 1917. Fourteen countries received anthracite in March of this year as compared with four countries in March of last year.

	Anthracite		Bituminous		Coke	
	1920 Tons	1919 Tons	1920 Tons	1919 Tons	1920 Tons	1919 Tons
Argentina	3,060		20			
Barbados	70	25				
Brazil						77
Canada	2,843	586				
Chile	248				445	
Costa Rica					25	
Cuba	121	5			694	2
Dutch E. I.					100	
Ecuador	861				2	
France	896					274
Guatemala						20
Germany	2					
Italy	32		15			
Jamaica	25					
Mexico	220			134		
Netherlands			4564			
Norway					45	
Panama					9	6
Peru	40		50			1
San Domingo	1,949	288			25	10
Venezuela	3			6	4	
Totals	10,370	904	4,649	140	1,349	390

Coal Imported by Dutch East Indies

Consul Harry Campbell reports that the Soerabaya consular district, comprising the Celebes, New Guinea, the Moluccas, Bali, Lombok, Soembawa, Soemba, Flores, and all islands east of 120 deg. east longitude; all that portion of Borneo east of 112 deg.; and in Java the Residencies of Soerabaya, Madioen, Rembang, Kediri, Pasoerean, Madoera, and Besoeki, imported 31,999 tons of coal in 1918, compared with 29,124 tons in 1917.

Coal Production in South Africa 1910-1919 Inclusive and During January and February, 1920

Period	Transvaal Tons Sold	Transvaal Value at Pit Mouth £	Transvaal Value per Ton s. d.	Cape Tons Sold	Cape Value at Pit Mouth £	Cape Value per Ton s. d.	Orange Free State Tons Sold	Orange Free State Value at Pit Mouth £	Orange Free State Value per Ton s. d.	Natal Tons Sold	Natal Value at Pit Mouth £	Natal Value per Ton s. d.	Union of South Africa Tons Sold	Union of South Africa Value at Pit Mouth £
June to December, 1910	2,345,427	584,069	4 11.77	56,840	36,444	12 9.88	303,002	84,931	5 7.27	1,455,506	418,105	5 8.94	4,160,775	1,123,549
Year, 1911	4,343,680	1,020,539	4 8.39	89,023	51,550	11 6.98	482,690	137,616	5 8.42	2,679,551	725,448	5 4.98	7.594,944	1,935,153
Year 1912	4.751,850	1,044.986	4 4.78	74,701	41,257	11 0.55	525,459	141,380	5 4.57	2,765,068	771,755	5 6.99	8,117 078	1 999,378
Year 1913	5 225,036	1,142.598	4 4.48	67,481	38,752	11 5.82	609,973	167,409	5 5.87	2,898,726	891,699	6 1.83	8,801.216	2,240,458
Year, 1914	5,157.268	1,150,746	4 5.55	53,621	31,167	11 7.50	699,217	191,064	5 5.58	2,567,817	885,919	6 10.80	8,477.923	2,258,896
Year, 1915	5,202,805	1,145 060	4 4.82	46 850	26,591	11 4.22	727 553	188 364	5 2.14	2,304.116	782,464	6 9.50	8.281,324	2,142,479
Year, 1916	6,136,913	1,382,680	4 6.07	41,752	24,092	11 6.49	762,576	198,699	5 2.54	3,066.261	1,134,194	7 4.77	10, 007 502	2 739.665
Year, 1917	6 641,229	1,586,062	4 9.32	8,300	5,950	14 4.05	843,095	217,292	5 1.86	2,890.296	1,466,304	10 1.76	10,382.920	3,275,608
Year, 1918	6,438.961	1.632,361	5 0.84	4,654	3,566	15 3.89	826,577	229,736	5 6.70	2.607,133	1,358,934	10 5.10	9,877,325	3,224,597
Year, 1919	6 622,313	1.694,131	5 1.40	4,759	3,750	15 9.12	838,059	231,332	5 6.25	2,801,004	1,487,031	10 7.41	10,266,135	3,416.244
1919—February	510,172	131,563	5 1.89	367	278	15 1.80	63,757	17,662	5 6.48	223,888	121.042	10 9.75	798.184	270,545
March	538,332	137,802	5 1.44	335	261	15 6.99	69,597	19,217	5 6.27	238,059	128,747	10 9.80	846,323	286,027
April	545,081	140,496	5 1.86	383	298	15 6.74	68,386	18,843	5 6.13	223,806	120,062	10 8.75	837,656	279,699
May	559,566	142,073	5 0.94	419	355	16 11.34	77,511	21,694	5 7.17	231,995	124,646	10 8.95	869,491	288,768
June	554 954	139 482	5 0.32	459	384	16 8.78	67 027	18,682	5 6.89	203,117	111,855	11 0.17	825,557	270,403
July	524,745	132,781	5 0.73	469	363	15 5.76	76,697	21,068	5 5.93	241,570	126,955	10 6.13	843,481	281,167
August	554,920	141,726	5 1.30	387	311	16 0.87	73,205	20,059	5 5.76	196,084	103,509	10 6.69	824.596	265,605
September	605.422	153,691	5 0.93	357	290	16 2.96	77,900	21,292	5 5.59	264,185	140,860	10 7.96	947,864	316,131
October	590,922	153 267	5 2.25	403	311	15 5.21	67,022	18,381	5 5.82	263,091	142,609	10 10.09	921,438	314,568
November	532,955	137,346	5 1.85	467	352	15 0.90	59,406	16,267	5 5.72	229,352	120,931	10 6.55	822,180	274 896
December	531 267	135,907	5 1.40	398	312	15 8.14	70,535	19,189	5 5.29	250,288	136,114	10 10.52	852,488	291,522
1920—January	525,496	141,127	5 4.45	440	359	16 3.82	77,603	21,450	5 6.34	230,880	131,917	11 5.13	834,419	294,853
February	494 954	137.917	5 6.88	553	417	15 0.98	71,000	20,215	5 8.33	212.610	122.736	11 6.55	779,117	281,285

Scarcity of Coal Forces Down Tonnage Rates to Europe

W. W. Battie & Co.'s coal trade freight report states that, owing to the scarcity of coal and the large number of foreign steamers that are offering, freight rates to Europe have crumbled very materially. Owing to the poor outlook for homeward business, rates to South America are particularly firm. The situation in business to the West Indies is unchanged.

Rates quoted are as follows:

	Rate	Tons Displaced
Copenhagen	About 23.00 —	1,000
Stockholm	About 24.00 —	800
Gothenburg	About 23.00 —	1,000
Antwerp/Rotterdam	18.50/19.00 —	1,000
Hamburg	20.50/21.00 —	1,000
French Atlantic, excluding Rouen	19.00/19.50 —	700
Barcelona	About 22.00 —	1,000
Algiers	21.00/22.00 —	800
Genoa/Leghorn	About 22.00 —	1,000
Spezia/Savona	About 22.00 —	1,000
Piraeus	25.00/26.00 —	1,000
Trieste/Venice	25.00/26.00 —	1,000
Port Said	25.00/25.50 —	1,000
Constantinople	25.00/26.00 —	500
Pernambuco	14.50/15.00 —	500
Bahia	14.50/15.00 —	500
Rio	14.50/15.00 —	1,000
Santos	15.00/15.50 —	600
Buenos Aires or La Plata or Montevideo	13.50/14.00 —	1,000
Para	About 14.50 —	500
Rosario	About 15.00 —	750
Bahia Blanca	About 15.50 —	1,000
To Nitrate Range	9.00/10.00 —	750
Havana	6.50/ 7.00 —	600
Sagua or Cardenas	About 8.50 —	300
Cienfugos	8.00/ 8.25 —	500
Caibarien	About 8.50 —	300
Guantanamo	8.00/ 8.25 —	500
Manzanillo	About 9.00 —	300
Bermuda	7.00/ 7.50 —	300
Bermuda p. c. and dis. free		
Kingston	About 9.00 —	400
St. Lucia	About 10.00 —	500
Barbados	About 10.00 —	500
Santiago	8.00/ 8.25 —	500
Port of Spain, Trin	About 10.00 —	500
Curacao	9.00/ 9.50 —	500
Free p. c. Curacao		
Demerara	13.00 —	400
St. Thomas	About 9.00 —	500

All above rates gross form charter.

Great Britain Builds Few New Coke Ovens

Progress in coke oven constructional work in Great Britain during the past year, according to *The Colliery Guardian*, was not very marked. Beyond a certain number of small extensions to existing batteries which had been put in hand in 1917 and 1918 under the auspices of the Ministry of Munitions no great amount of new work was started. This, of course, is attributable to a variety of causes, but mainly to the state of the colliery and coal businesses generally, where the vacillating policy of the Government, combined with the attitude of the Miners' Federation, has caused owners and capitalists to be unwilling to go forward with schemes until the situation is clearer.

Coal Prices Issued in Paris

Prices of the several kinds of coal, effective from March 16, 1920, Consul General A. M. Thackara, Paris, France, reports, were issued by the préfet of the Seine for the city of Paris, as follows: Anthracite, nut, 450 francs, or $86.85, per ton; anthracite, large, 430 francs, or $82.99; anthracite, small, 390 francs, or $75.25; run of the mine (tout venant), 400 francs, or $77.20; boulets and briquets, 425 francs, or $82.02. Wood belonging to the municipality will be sold at a uniform price of 160 francs, or $30.88, per ton. The conversion rate used above was $0.193 to the franc.

Coal Demand of Japan Exceeds Supply

Wheelock & Co.'s coal market report issued at Shanghai, March 25, states that there is no change to report in the Japanese coal market since a fortnight previous and that there has been practically no new business done. Stocks on the spot are up to the average and deliveries to consumers are going on as usual. In Japan supplies are not nearly enough to cope with the demand and sellers are experiencing great difficulty in meeting requirements for bunker coals.

The market for Kaiping coal has ruled quiet but firm during the past fortnight. Although coal has been taken regularly under contract there is little new business to report. Stocks are much below the average and the demand for lump and the better grades exceeds the supply.

Coal prices are quoted as follows:

JAPAN COAL

Miike lump	ex wharf	Contracted for
Miike small	ex wharf	Contracted for
Miike dust	ex wharf	Contracted for
		Taels
Kishima lump	ex wharf	14.00
Kishima dust	ex wharf—no stock	10.00
Shakano lump	ex wharf	13.00
Arate lump	ex wharf	12.00
Shimoyamada kirigomi	ex wharf	11.00
Shin shakano kirigomi	ex wharf	11.00
Yoshinotani No. 1 lump	ex wharf	12.00
Yoshinotani No. 2	ex wharf	10.00

KAIPING COAL

	Taels per Ton ex Wharf
Ioco lump	13.50
Linsi lump	10.00
Washed nuts	13.50
Washed slack	10.50
No. 1 slack	9.00
No. 2 slack	8.50

Switzerland Can No Longer Depend Upon Germany for Coal

As Germany's Production of Coal Has Considerably Decreased and the Fatherland Has Had to Cede the Saar District to France, the Swiss Must Look Elsewhere for Fuel

Consul General Leo J. Keena, Zurich, transmits the following translation of a report made by the Secretary General of the Swiss Department of Public Economy on the Swiss coal situation:

During normal times the Swiss consumption of coal amounted to from 3,300,000 to 3,600,000 tons per year. As Switzerland has no coal mines of importance, its coal consumption is about equal to the quantities of coal imported. Coal, briquet, and coke imports during 1913-1918 were as follows (metric ton = 2,204.6 pounds):

	Metric Tons
1913	3,379,007
1914	3,107,796
1915	3,311,442
1916	3,151,521
1917	2,269,872
1918	2,141,381

On an average this import consisted of coal 60 per cent, briquets 7 per cent, and coke 33 per cent. The chief source of supply was Germany, with coal from the Saar and Ruhr regions; Belgium and, to a small extent, France also contributed.

Prior to the war the coal was consumed as follows:

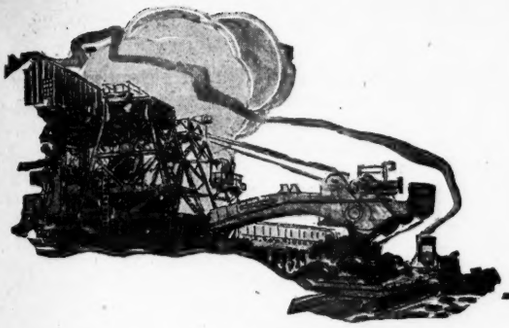
	Metric Tons	Per Cent
Transportation of all kinds	720,000	20
Gas works	600,000	17
Chief industries	1,080,000	30
Households and small industries	1,200,000	33
Total	3,600,000	100

Germany furnished most of the coal before the war, exporting it by rail direct from the mining regions. A certain percentage of coal from the Ruhr district was shipped via the Rhine and discharged in transit in ports of the upper Rhine, to be transported from there on by railway. This was also the case with coal from Belgium, while coal from France was transported exclusively by rail.

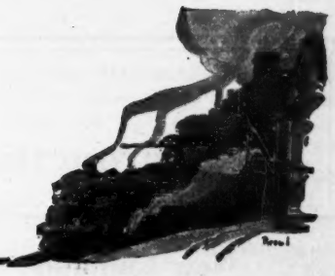
Up to the spring of 1919 a great many coal importers participated in the importation of coal. Since April 1, 1919, however, the importation has been centralized and is effected exclusively by the Swiss Coal Association at Basel, which is an organization of the former principal coal importers and is to be considered as of a semi-official nature.

Through the stipulations of the peace treaty, the former chief supplier to Switzerland — namely, Germany — is obliged to furnish the Allies with large quantities of coal, especially France, Belgium, and Italy. Owing to the fact that the German production of coal has considerably decreased and that Germany has had to cede to France its Saar district, which heretofore participated to no small extent in the Swiss coal supply, Germany will no longer be able to furnish Switzerland any great amount of coal.

The same thing is true of Belgium and France. For some time to come neither of those two countries will be in a position to export coal to Switzerland to a degree worth mentioning, although France is furnishing us (in an appreciable way) with a certain minimum of coal from the Saar district. However, the quantity which is actually being received here amounts to only about one-third as much as was furnished to Switzerland in peace times and during the war until the armistice.



Production and the Market



Weekly Review

Output Decreases, Cost of Production Mounts and Consumers Clamor for Coal the Mines Cannot Supply—Car Shortage and Labor Troubles on Roads Precipitate the Crisis—Bituminous Prices Raised—Anthracite in Good Demand—Coke Scarce and High

DESPAIR rules the coal situation today. Production is again on the decrease, labor is dissatisfied with the short running time and lowered earnings, costs of production have mounted and consumers are calling for coal that the mines cannot ship. The cause of the trouble at the mines is car shortage, and the cause of the car shortage is labor trouble on the railroads.

The long-continued condition of lack of transportation has so increased costs that prices of bituminous coal have generally been raised from 25 to 50 cents per ton, but problems of price are of secondary consideration. It is reported that none of the large Eastern companies has been able to keep up contract shipments, with the result that buyers have offered as high as $7.50 per ton for mine-run coal.

One of the very great difficulties now is the constant placing and raising of freight embargoes. Shippers can never offer any assurance to their customers regarding a single car of coal. Many large industries in New England have reported a suspension of operation because of lack of coal and those that have stocks see them becoming rapidly depleted, with but little source for future supply.

There is little the coal man can do today except ship his little coal and wait for the railroads to get straightened out. The pressure on the Interstate Commerce Commission during the last ten days has been terrific and that body has been able to give to the shipping public that has been doing most of the complaining very little assurance of improvement in the near future.

Shipments to tide for export are limited even at Hampton Roads and Lake movement is very light. The railroads are getting or taking the larger share of present output of bituminous coal.

Anthracite continues in good demand. New prices have been announced, even though a wage scale has not been negotiated.

Fancy prices rule for coke, with very little free coke to be had. Production here also is limited by car supply.

Average Daily Production of Bituminous Coal*

*From weekly report of Geological Survey

Reports From the Market Centers

New England

BOSTON

Traffic Troubles Continue — Prices Show No Material Change — Canadian Demand Is a Factor—Federal Intervention—Hampton Roads Market Fairly Even—Anthracite Companies on a New Price Basis—Demand Strong for Domestic Sizes—Less Activity in Buckwheat.

Bituminous—As yet there is no let-up in the deplorable traffic situation that confronts New England. The congestion at the Boston & Maine gateways, that made the embargo of May 13 necessary, is being relieved only gradually. Probably it is only a question of time when still other gateways will be clogged.

The New Haven R.R. is able to make more deliveries of empties to the intervening lines, but the block on eastbound freight continues almost unabated. Current embargoes have naturally had their effect upon the spot market. Neither buyers nor factors in the trade can see their way clear to make arrangements for prompt coal, when they know that shipments all-rail are almost an impossibility. The result is a quiet market. New England is confining itself today to getting better movement on contract purchases, rather than to spot buying.

While prices might be expected to recede slightly, the volume of buying in other directions is sustaining the quotations of a week ago. $6.50@$7 is the ruling level on the better grades from Central Pennsylvania. The lower grades are still to be had at prices ranging from $5.50@$6.25. Consumers here have practically given up buying spot coal from sections more remote.

Active buying in Canada has given a buoyancy to the current market it might not otherwise have. Thus New England is likely to have competitive buying from Canada for several weeks to come. Prices will be bid up to $8.

The West Virginia coals are now being absorbed in the Middle West and off shore; Canadian purchasers are left with only the Pennsylvania districts to draw upon.

Anthracite—With the announcements on May 15 and May 17 of the old-line companies, that advances of 85c to $1 would be effective from those dates, practically every anthracite shipper is now on a new price basis. The agreement with the mine-workers, although not formally announced, has been discounted by retailers in this territory.

Pressure continue strong for the domestic sizes. The new high price for broken indicates to the trade that this size may be restricted to special uses. This should mean an increased consumption of egg size which would help materially in distribution. Shipments by water continue to come forward with fair regularity, although the all-rail route is still under great disadvantage.

The steam sizes are only in moderate demand. Large buyers of bituminous are discriminating carefully between different grades of buckwheat and there is less active buying than prevailed 60 days ago.

NEW YORK

Local Deliveries Show Slight Improvement — Retail Dealers in Need of Coal — Big Producing Company Announces Increase in Prices — Harbor Troubles Interfere with Deliveries — Bituminous Shipments Slow — Vessels Leave for Other Ports for Coal — Car Supply Improves Slightly.

Anthracite—The local retail market situation has slightly improved, as more coal is being received, where railroads can make all-rail deliveries to yards.

The wholesale market is mixed. No wage agreement has been reached by the operators and miners. But the price situation has been clarified by the following announcement of new prices (f.o.b. mines) by the Philadelphia & Reading company retroactive from May 11; Broken, $7.50; egg, $7.20; stove, $7.45; chestnut, $7.50; pea, $5.75; buckwheat, $4.10; rice, $3.00; and barley, $2.25. The Delaware, Lackawanna & Western, Lehigh & Wilkes-Barre and the Lehigh Valley companies have not, as yet, made any changes in their schedule of prices. The variation in prices has caused much confusion among the retail dealers who have several sources of supply.

With the Federal Government taking a hand in the movement of coal and the local harbor trouble, it is thought that shipments to this harbor should show an improvement within a few days.

The companies sending their output to the upper ports in this harbor have been able to make quicker deliveries to customers than have those shipping to the lower ports.

Current quotations for company coal per gross ton at mine and f.o.b., tidewater, at the lower ports are as follows:

	Mine	Tidewater
Broken	$5.95@$7.50	$7.80@$9.35
Egg	6.35@ 7.35	$8.20@ 9.20
Stove	6.60@ 7.70	8.45@ 9.55
Chestnut	6.70@ 7.70	8.55@ 9.55
Pea	5.30@ 5.75	7.05@ 7.50
Buckwheat	3.40@ 4.10	5.15@ 5.85
Rice	2.75@ 3.25	4.50@ 5.00
Barley	2.25@ 2.50	4.00@ 4.25
Boiler	2.50	4.25

Bituminous—The greater movement of coal cars, as promised by the railroads, will go a long way towards improving market conditions, but is not likely to change local conditions to any great extent unless decisive action is taken to remedy harbor conditions here.

Quotations change over-night and deliveries are uncertain. The railroads are still taking coal in large quantities for their own use, much to the detriment of shippers and their customers. Car supply is said to be better, some districts reporting a greater percentage of receipts than for several weeks back.

Local labor troubles have caused many steamers to go to the Southern ports for bunker supplies. Reserve supplies at the factories depending upon water deliveries are showing usage, while the inland plants have plenty of coal for immediate need.

Grades are little thought of by buyers these days unless it is absolutely necessary, and medium coals have been quoted at from $6.50 to $7 at the mines, while tidewater quotations have been firm around $10 to $10.50 with slight increases heard of in some instances.

PHILADELPHIA

All Anthracite Companies Announce Price Schedule—Dealers Receive Light Shipments and Stocks Are Depleted—One Big Company Contracting Certain Sizes — Bituminous Trade in Bad Shape — Small Tonnage Arriving — Active Vessel Chartering.

Anthracite—Despite the fact that the wage controversey has not yet been settled, all shippers have now announced a price schedule for the current month. The biggest stripper announced prices from May 11 as follows: Broken $7.50, egg $7.20, stove $7.45, nut $7.55 pea $5.75, buckwheat $4.10, allowing other sizes to remain unchanged. These are the lowest prices for any company, the nearest other big company being 15c higher on egg, 25c on stove, 15c on nut and 25c on pea. All prices quoted are f.o.b. mines per gross ton, and are subject to change without notice.

The dealers in this territory are most urgently in need of coal of all sizes. The desire of the consumer for stocking has been so strong that the supplies of all retailers have been depleted. The bulk of the production seems to be going into New England, although the West is also beginning to get a share.

The independent shippers are said to be getting quite a little advance over the circular prices announced by them in the outside markets, and there are reports of sales of egg, stove and nut around $9.50 to $9.75, at the mines.

The dealers received big shipments five weeks ago and they cannot expect any heavy consignments until next fall. The retail prices for stove and nut vary from $12.75 to $13.50. Pea is pretty generally held around $10.50 a ton.

Using the present prices of the largest shipping company as a basis, the prices per gross ton at mines for line delivery and f.o.b. Port Richmond for tide are as follows:

	Line	Tide
Broken	$7.50	$9.35
Egg	7.20	9.35
Stove	7.45	9.30
Nut	7.55	9.40
Pea	5.75	7.35
Buckwheat	4.10	5.15
Rice	3.00	3.90
Boiler	2.50	3.50
Barley	2.25	3.15
Culm	1.50	2.40

BALTIMORE

Great Export Demand Forces Soft-Coal Prices Up — Best Coal, $7 at Mines — Many Ships Await Export and Coastwise Cargoes—Anthracite Prices Moving Up and Receipts Light.

Bituminous—Soft coal prices have gone up and up under the great export demand at tide here, the steady call for coal to keep domestic plants running and the fact that the car supply is so poor.

The average range of prices here, mine basis the net ton, are as follows: Best coals, such as run to pools 9 and 71, $7.25 to $7.50; No. 10, $7 to $7.25; No. 11, $6.75 to $7, and No. 18, $6.50 to $6.75. The low level of prices is around $6.50 for the least desirable coals at the mines the net ton.

As high as $8.50 and $8.60 a gross ton is being paid at the mines for best coals, and around $7.80 a gross ton for only a fair run of coal at the mines. Gas coals are about on a par with the quotations on steam coals as above; any screened high-volatile fuel being worth around $7; and run-of-mine around $6.25 to $6.50.

The great export demand continues, but conditions have combined to cause a congestion of vessels. At present there are between 30 and 40 ships astream here waiting to take on a total of about 175,000 tons.

The Curtis Bay pier of the Baltimore & Ohio has set still another world's loading record. On Thursday last a steamer was loaded with 7,222 tons in one hour and 58 min., or at rate of 3,672 tons an hour.

Anthracite—Hard coal keeps moving up in the wholesale prospect. Some of the independents are talking of $8.50 per ton coal f.o.b. mines. Such a price would mean, with a $2.68 freight rate (as at present) and a gross margin of profit for retailers of between $2.50 and $3 per ton, a cost of around $14 or more to the consumer, with the prospect of a $15 ton of coal for next fall. Receipts here are light, and coal men are merely booking orders at a price to be set at time of delivery.

Lake

BUFFALO

No Improvement in Bituminous Situation—Mines North of Pittsburgh Furnish Coal — Pittsburgh Out of Local Market — Lake Loading of Anthracite Active—Coke Strong but Inactive.

Bituminous—The situation does not improve, some shippers declaring that it grows worse every day. Still the factories and public utilities keep going unless they are held up by strikes.

But for the activity of the mines this side of Pittsburgh, such as Allegheny Valley, Reynoldsville, Shawmut and Clearfield, the bituminous trade would be completely demoralized, for it is practically impossible to get Pittsburgh coal at Buffalo, the strike in the Pittsburgh district being much more general than it is further north.

No Pittsburgh coal is to be had, so it is not possible to obtain any figures of that trade; as to other coal, the prices are $6 up at the mines for mine-run, which is about all that is offered, Clearfield being always marketed in that form. The latter does not come here in any quantity, for the freight is too high, but it can be sold to cover the eastern market of the state and New England.

Anthracite—The fixing of the price of hard coal has added 85c. a ton to the wholesale prices of the leading sizes, with a ten-cent monthly addition besides. Not all of the companies have yet adopted this advance, but they probably will do so. The supply is so short that coal consumers cannot complain much.

The Lake loading of anthracite is active, considering that only two companies have gone into it as yet this season. For the week the loading amounted to 89,400 net tons of which 11,400 tons cleared for Chicago, 18,600 tons for Milwaukee, 8,500 tons for Sheboygan, 46,900 tons for Duluth-Superior, and 4,000 tons for Detroit.

Coal freights have been fixed at 50c. to Duluth and principal Lake Superior ports, 60c. to Milwaukee, 65 and 70c. to Chicago and 10c. more to minor ports.

Coke—All coke is strong, but not active at rather irregular prices, as the consumers will not buy in the open market if they can help it. Jobbers quote Connellsville foundry at $15.10, furnace at $13.60 and chestnut domestic at $9.90, all per net ton, f.o.b. Buffalo.

CLEVELAND

Bituminous Stocks Low—Interstate Commerce Commission Inaugurates Priorities—Price Tendency Upward—Lake Shippers Enter into Pooling Arrangement.

Bituminous.—Stocks at industrial plants are running dangerously low, while everyday additional plants are reported either shutdown or crippled. Inauguration of priorities for coal by the Interstate Commerce Commission, which may bring mine operations and coal receipts above the present 30 to 40 per cent of normal, constitutes the only present visible ray of hope in the situation. The price tendency for most grades of coal continues upward and dealers predict that regular monthly increases of at least 10c. a ton are probable throughout the summer.

Pocahontas and anthracite — The looked-for boost in anthracite prices has been made, egg being quoted at $13.20; grate from $13.20 to $13.50, and stove $13.50. Shoveled Pocahontas also has been advanced to $11.75 from $10.50. Supplies are scant, but the demand of domestic consumers, seeking to lay in next winter's supply, is growing.

Lake trade—Although the pooling arrangement entered into by Lake shippers has been undertaken in the hope of averting a famine in the Northwest, shippers say that its success depends wholly upon the car supply. Railroad men say that the best that can be hoped for is a 60 per cent car supply during the present season, and at present it is far below that figure. The pooling arrangement follows the war-time plan in effect in 1918.

Retail prices of coal per net ton delivered by dealers in Cleveland are:

Anthracite — egg, $13.20; grate, $13.20@$13.50; chestnut, $13.50, and stove, $13.50.

Pocahontas—shoveled lump, $11.75; and mine-run, $9.25.

Domestic bituminous—West Virginia splint, $9.50; No. 8 Pittsburgh, $7.75; Millfield lump, $9.10, and cannel lump, $11.50.

Steam coal—No. 6 and No. 8 slack, $8.50; No. 6 and No. 8 mine-run, $8.50, and No. 8 ¾-in. lump, $8.

MILWAUKEE

Soft-Coal Supply Uncertain—No Way Found to Relieve Situation—Domestic Anthracite Plentiful With Prices Steady.

Uncertainty of the soft coal supply is keeping Milwaukee manufacturers anxious. It is a "hand-to-mouth" game at present, with all industries and public utilities scraping their bins daily. Any prolonged interruption of the meager supply would lead to a shut down of numerous factories.

Many conferences of business men and city officials have been held, but no way has thus far been found to relieve the situation. The railway strike must be settled and more coal cars furnished before an improvement can be expected. Receipts by Lake and rail continue much below normal.

Domestic consumers of anthracite find little difficulty in procuring supplies and deliveries of this nature are quite brisk. Prices are held steady. Consumers of steam coal demur at present prices, but are forced to accept the situation. The summer schedule of rates on coal is due and will probably be formulated before the end of May.

Cargo receipts by Lake (up to this writing) aggregate 86,890 tons of anthracite and 102,920 tons of soft coal, against 150,839 tons of the former, and 438,661 tons of the latter up to the same date last year.

Inland West

COLUMBUS

Lake Priority Orders Desired — Reduced Output from Ohio Mines — Demand Strong and Prices Soaring — Railroads Taking Fair Tonnage — Hocking Valley and Pomeroy Bend Furnish Bulk of Coal.

Shippers are trying to get priority orders for Lake movement and the Ore & Coal Exchange, at Cleveland, under the management of H. M. Griggs has been revived. So far the amount of coal loaded amounts to practically 700,000 tons, as compared with about 4,000,000 tons in previous seasons. A crisis can only be avoided by quick action. The requirements of the Northwest are placed at approximately 28,000,000 tons.

Reduced car supply resulting from the Switchmen's strike and the attending congestion here reduced the output in Ohio mining districts to about 40 per cent of normal. Eastern Ohio is probably in the worst condition with only 25 per cent operation. In the Hocking Valley field the output is about 40 per cent and possibly higher. Cambridge and Crooksville report about the same percentage. Pomeroy Bend district is having about 50 per cent run which shows up slightly better than the previous week.

Demand is increasing from all sources In the steam field, manufacturing plants are actively bidding for free tonnage in competition with public service concerns and with state and county institutions. Quite a few manufacturing plants have been partly closed for want of fuel. Others are operating from hand to mouth without adequate reserves. Prices are consequently soaring. Railroads are taking a fair tonnage, part of which is being confiscated.

In the domestic trade retailers are out of stocks. Prices do not appear to be an object at this time but rather the ability to receive shipments promptly.

Pocahontas is practically out of the Columbus market. Some West Virginia splint is arriving but the main bulk of local supplies comes from the mines of the Hocking Valley and Pomeroy Bend. Retail prices are soaring in sympathy with quotations at mines.

Hocking lump is selling at $7.50 to $8 delivered, while mine-run is about 25c. lower. West Virginia splints are retailing at $8.50 to $8.75 for lump and practically the same for mine-run. Pomeroy lump is strong around $8 and Pocahontas is retailing at $10.50 to $11.

Prices at the mines of the principal coals used in Ohio territory are:

Hocking lump	$4.50 to $5.00
Hocking mine-run	4.25 to 4.75
Hocking screenings	4.00 to 4.75
Pomeroy lump	4.55 to 5.00
Pomeroy mine-run	4.25 to 4.75
Pomeroy screenings	4.25 to 4.75
West Virginia splints lump	5.25 to 6.00
West Virginia mine-run	5.00 to 6.00
West Virginia screenings	4.75 to 5.75
Pocahontas lump	6.50 to 7.25
Pocahontas mine-run	6.50 to 7.25
Pocahontas screenings	6.25 to 7.00

CINCINNATI

Little Improvement in Fuel Situation—River Transportation Increased—Operators Prepare to Store at Mines—Prices Firm and Demand Excellent from Householders.

There has been little, if any, improvement in the local fuel situation, the demand for all kinds of coal continuing intense. Every endeavor is being made to increase the volume coming down the Ohio River, as operators feel that this is about the only channel through which a somewhat like normal supply can reach Cincinnati and vicinity.

Kentucky mines are better supplied with cars than those of Ohio, West Virginia and Indiana, but on the whole, even the car supply in Kentucky is far below the adequate needs of the operators.

Practically all Cincinnati coal companies have prepared for shortage at the mines, hoping in that way to be ready, when rail conditions right themselves sufficiently, to get the coal to market. The larger companies are finding it a hard matter to stem the tide of higher prices and cannot safely take new orders. The conservative prices for smokeless coal are $5.25 for lump and egg, and $4.25 for run-of-mine, delivered, carrying in addition the wage increase of April.

Splint coal of the better grade is quoted by the conservatives at $4.50 for block (lump and egg); run-of-mine, $4.25; and nut-and-slack, $4. Other companies are quoting $4.50 to $6.50 for lump, egg (block, all sizes) and nut-and-slack; run-of-mine, $5 to 6, and in many cases $6.50.

In the retail market the demand from the householders continues excellent. Prices are firm. The retail prices delivered are: Bituminous—lump, $8 to $8.25; nut, $6.75 to $7.50; run-of-mine, $7.25. Smokeless—lump, $9.25; run-of-mine, $8.50. Anthracite sells at $14.

ST. LOUIS

Railroad Conditions Still Bad, with Few Empties to Mines—Demand Good for All Coal, at Top Prices, with Little Moving — Railroads Get Most of the Coal.

There is not much improvement in the local railroad terminals. A little coal continues to move in to St. Louis in train lots of 10 to 30 cars to central unloading points; but the switching facilities are such that cars cannot be set in at different plants. Many plants are running on reduced time on account of the lack of fuel.

On account of car shortage the price of coal continues to go up. Chicago parties are bidding in the St. Louis market as much as $4.25 for mine-run, $4.50@$4.75 for lump, egg and nut, and $3.50 and upwards for screenings.

In the Standard field the mines are working from one to three days a week on railroad coal. In the Mt. Olive field a little better working time is given on commercial coal, perhaps two days a week. The railroad tonnage continues heavy. The prices here range from $3.25 to $3.50 for domestic sizes, and $2.75 for mine-run. Steam sizes are all contracted.

In the Carterville field of Williamson and Franklin counties the circular is not being maintained. Working time varies from one day a week on commercial coal to five days a week on railroad coal; the mine loading railroad coal gets all the cars.

The Missouri Pacific R.R. is trying to obtain a $2.60 price on mine-run coal for railroad use, while many other roads are paying higher. A somewhat similar condition exists on some of the trunk lines entering East St. Louis with regard to the operators on their roads. The Pennsylvania is reported to have purchased 1,000 cars of 2-in. lump at about $3. at the mine.

Retail prices have not changed and the demand is easy. No Arkansas is moving in and nothing from the eastern smokeless fields. A little anthracite is on the way. The supply of coke is exhausted.

DETROIT

No Improvement in Soft-Coal Situation—Utility Companies Appeal to Interstate Commerce Commission—Little Anthracite Coming In—Pooling System for Lakes.

Bituminous—Shipments of bituminous coal into Detroit and Michigan appear to show no substantial increase. Industrial establishments and many public utility plants throughout the state are maintaining operation on practically a day to day supply, with uncertainty as to being able to continue. Insufficient supply of railroad equipment is held to be the principal reason for deficiency in shipments.

Representatives of public utility companies of the state who visited Washington May 19, presenting their appeal for relief to the Interstate Commerce Commission, were unable to obtain any promise that coal would be supplied in more liberal amount. The suggestion that a priority order be made to apply to coal consigned to Michigan public utilities, was productive of no action along that line. The commission advised the delegation that it would be necessary for the people of Michigan to take the places of the striking railroad switchmen if the railroads were to deliver coal.

It was brought out in the hearing that a number of Michigan manufacturers have sent representatives to the mining regions, and, in the effort to get coal, prices have been bid up to as high as $6.75 a ton at the mines for mine-run.

Anthracite—Little anthracite is coming to Detroit and yards of retail dealers are in many instances without stock. The outlook is pronounced quite unfavorable and predictions are being made that many household consumers will be unable to get a supply for next winter.

Lake Trade—In the effort to facilitate shipments of coal by Lake routes, shippers and the transportation companies have agreed to renew the pooling system, which was in effect in 1918, during the remainder of this season.

MIDWEST REVIEW

Operators Have Filled Old Orders and Now Sell Spot Coal—Factories Run on Quite Short Stocks — Railroads Hold Coal on Sidings — Leading Roads Optimistic—Car Pooling Approved.

Coal can now be purchased at a price, whereas even a week ago, steam plants and wholesalers were having difficulty in making purchases at any price. Operators have been able to fill old orders and are now holding all of their coal for current shipments.

Spot coal is bringing a premium. The better grades of coal from Illinois are still being sold at circular prices, but other grades, both from Illinois and Indiana, are being sold to the highest bidder.

The congestion caused by the switchmen's strike, and the resulting embargoes, is still hurting traffic. Practically every factory in the Middle West is running on a hand-to-mouth basis. The average householder is quite nervous and is doing everything he can to buy his winter's supply of coal during the summer months.

It is said that the railroads are holding considerable coal on their lines, considering confiscation. This rumor has caused widespread dissatisfaction among coal men.

The railroads claim they are not holding coal, but are trying to ship fuel right through to destination as quickly as possible. However, there are a number of side tracks filled with loaded cars of coal.

The Chicago & Alton claims that the movement of fuel to industries is nearly normal. The Chicago, Burlington & Quincy states that it is now loading about five hundred cars daily against a normal seven hundred. Other roads report in a like manner.

The railroads applied to the Interstate Commerce Commission for assistance and the commission is considering the pooling of cars as was done during the war. It is generally thought that the pooling system will help matters a great deal.

It is hoped that when the car-pooling system is inaugurated, Illinois and Indiana mines will be able to run at least fifty per cent of the time, as then the situation will be quite rapidly relieved.

CHICAGO

Chicago Faces Fuel Famine—Critical Condition of Yards of Large Retail Dealers — All Look to Interstate Commerce Commission for Relief.

Chicago is now face to face with a fuel famine. This shortage, of course, is a direct result of the freight congestion and lack of coal cars at the mines. Luckily, earlier in the week, the weather suddenly became warmer.

Dealers are supplying their domestic trade in half-ton lots. Steam plants are so short of coal that they are depending entirely on the railroads for prompt deliveries. If there is any delay the factory shuts down awaiting the arrival of the coal.

There is a concern in Chicago that maintains 47 retail yards. In normal times this company has approximately 150,000 tons of coal on hand. Today there are 7,000 tons in its various yards. This concern says if it receives and unloads 225 cars per day from now until Nov. 1, the company will go into the winter months without any appreciable surplus on hand.

The coal trade and those interested in the trade, are earnestly hoping that the proposed plan of the Interstate Commerce Commission to pool all coal-carrying equipment, will result in a much better car supply at the various mines.

If all the Illinois and Indiana mines receive a 50 per cent supply and only that for the next 90 days, it is pretty generally conceded fancy prices will disappear from the market, coal will be selling at reasonable prices, and there will be enough for everybody.

South

LOUISVILLE

Buyers Force Up Prices by Strong Demand for All Grades—Production Continues Light—Priority Ruling Expected to Improve Conditions.

Prices have advanced sharply during May as a result of buyers from Chicago and other points entering the Kentucky fields and bidding up the markets; being badly in need of immediate shipments, and not caring much about the price apparently.

There is a strong demand for all grades of coal. Retailers' yards are empty and they are buying steadily. Steam consumers are also buying and there is also a Lake region demand.

Practically no contracts are being made. Present selling is on a spot basis for immediate use, as lower markets are predicted.

Production in some sections of the state is on a 33 per cent basis, others doing as well as 45. Car shortage continues bad, but the new regulations and priority rulings are expected to aid materially.

Movement of solid trains of empties back to the mines may mean a much better fuel supply at an early date. However, much mine labor has deserted and it is a question whether mines can use a full car supply.

Quotations at mines are as follows: Western Kentucky block, $3.50@$3.75; mine-run, $3.25@$3.50; nut and slack, $3@$3.25; pea and slack, $2.75@$3.

Eastern Kentucky coals are selling at $4.50@$6.75 a ton, good byproduct mine-run and block selling at around $6.50@$6.75 except among a few operators who have restricted prices on block to $5, having advanced from $4.50. There is no material difference between mine-run and block prices in most instances today on the Eastern Kentucky market. Nut and slack in some instances has been quoted at $4.50 but it would be hard to find much under $6 a ton.

One concern reports quotations of $3.60 a ton for 1¼-in. Western Kentucky nut; $3.75 for 2½ in.; $4 for run-of-mine; and $5.25 for 4-in. lump, at mine.

Retailers have advanced prices fifty cents a ton on all grades. Eastern Kentucky block sells for $9.25; mine-run, $8.75; nut and slack, $8.25; steam mine-run, $7@$7.50; screenings, $6.50@$7; West Kentucky lump, $7.50; mine-run, $7; screenings, $6.50; steam mine-run, $6@$6.50; screenings, $5.50@$6.

BIRMINGHAM

Car Supply Irregular, with No Improvement Over Last Week—Stiff Demand for All Grades—No Spot Coal—Steam Coal Users Quite Short of Fuel — Mines Operate 80 Per Cent Normal.

Conditions in general affecting the coal trade in this district have shown little change during the past week. The car supply has improved little, if any. Production is badly demoralized by the irregular and uncertain car supply, at least one and two days per week being lost in many instances.

Although there is a stiff demand for all grades of coal, there is little to offer the spot trade and this comes mostly from the small mines. The larger companies are applying the restricted output they obtain to orders in hand in an endeavor to keep their customers going; they have no coal to offer and are, therefore, taking on no new business.

Industries, public utilities and railroads are all quite short on fuel and are operating on a practically hand-to-mouth basis. Premium figures of from 75c. to $1.50 per ton can be easily obtained for spot coal, but conservative interests are holding down quotations and not taking advantage of trade conditions to sky-rocket prices.

The Southern Ry. has placed some contracts the past week for fuel for the next 12 months, paying $2.85 to $3.20 per net ton mines for Big Seam mine-run coal. Its fuel contracts do not expire until June 30. Quotations for steam coal are as follows per net ton mines:

	Mine-Run	Prepared
Big Seam	$2.95@$3.25	$3.45
Black Creek	4.00	4.45@$4.50
Cahaba	4.00@ 4.35	4.35
Carbon Hill	3.35@ 3.50	3.50
Nickel Plate	3.35@ 3.50	

Domestic schedules are as follows per net ton mines:

	Lump
Big Seam	$3.50@$3.60
Black Creek	5.00@ 5.75
Cahaba	4.60@ 6.00
Carbon Hill	3.60@ 3.85
Montevalle	7.15
Corona	5.65
Straven	6.75

The output of the Alabama field, for week ended May 8, was approximately 329,000 tons. Labor is working irregularly, averaging about 80 per cent full time. There is also a shortage in some sections.

News From the Coal Fields

Northern Appalachian

FAIRMONT

Car Supply Uncertain and Much Idleness Results—Pennsylvania Moves Big Tonnage—P. & L. E. Badly Crippled—Tidewater Shipments Heavy — Railroads Take Half of Output.

The car supply in the Fairmont and other northern West Virginia regions, during the week ended May 15, was quite uncertain. Consequently much idleness resulted. For a time mines on the Monongahela R.R. were almost entirely without equipment. Throughout the northern part of the state transportation conditions were such that few if any mines were able to load to 50 per cent of potential capacity.

Monday's supply of empties on the Monongahela division of the Baltimore & Ohio amounting to 1,451 cars, enabled mines to load a fairly large tonnage but did not permit mines to load to capacity. Monongahela mines fared better with 314 cars than they did at any other time during the week, it being the largest supply vouchsafed the mines in some time.

Much congestion still existed at Brownsville, Pa., the northern gateway for all mines on the Monongahela R.R. While the Pennsylvania R.R., was moving a large volume of coal freight out of Brownsville, Pittsburgh & Lake Erie was still so badly crippled that it was unable to handle any coal, a strike on the part of additional switchmen and yardmen tending to further complicate matters.

The tonnage consigned to Lake docks during the week was extremely limited, due in part to the meager car supply and in part to the heavy tonnage going to tidewater.

While tidewater shipments continued to be unusually heavy, it was reported toward the end of the week that stocks of coal on hand at tidewater were growing low. Notwithstanding that fact, pool 18 (Curtis Bay) low-volatile coal, was under embargo. Shipments to Western markets in general were slim.

There were days, during second week of May, in northern West Virginia when only about half the cars furnished were being loaded with coal for commercial purposes, the other half of the output going for railroad fuel. The railroads obtained such fuel by assigning cars—a practice denounced by operators.

It was also reported that some of the coal from Fairmont region was being confiscated in transit. It was stated in some quarters that eastern railroads were closing contracts for railroad fuel at $3.50 a ton.

PITTSBURGH

No Improvement in Rail Coal Movement — Car Shortage Acute — River Mines Working Full — Shortage of Coal Everywhere — Fancy Prices for Gas Coal.

There has been no improvement in coal movement in the Pittsburgh district in the past week, or probably in the past fortnight. The river mines are working full. Rail shipments in the whole Pittsburgh district are not over about 25 per cent of normal.

The two main difficulties are, the car shortage in general and the fact that the Pittsburgh & Lake Erie is not functioning to any extent. The Pennsylvania and Baltimore & Ohio are operating moderately well, so far as the freedom of their rails is concerned, but they are quite short of cars.

The condition in this respect is different from that existing in the first two or three weeks of the rail strike, when there was fairly heavy loading, but many of the cars when loaded did not travel any distance. At the present time nearly all the coal loaded out gets through to destination.

The old congestion remains, and it will be one of the efforts of the railroads, under direction of the Interstate Commerce Commission, to clear this congestion. This in itself would give consumers a considerable tonnage of coal.

CONNELLSVILLE

Production Low, Regulated by Car Supply—Much Coke Going by Water—Demand Limited at High Prices.

Production in the past week has been about the same as in the previous period representing a slight decline from the maximum reached during the strike, and about two-thirds the rate prevailing before the strike. Production is regulated entirely by car supply, which is extremely poor.

The Pittsburgh & Lake Erie is scarcely functioning at all and it normally furnishes one-half the cars for the Monongahela R.R. The Pennsylvania and Baltimore & Ohio are operating fairly well so far as shipping is concerned, but are quite short of cars.

A quite considerable part of the output of the Connellsville region is going by water, and unusual efforts are being made to secure additional barges for this work. There is little stocking of coke now, and the "push ovens" cannot stock at all.

Nearly a week ago the spot furnace coke market advanced to $15, per net ton at ovens. Demand since then has been limited in point of tonnage, most of the furnaces that need coke refusing to pay such a price and preferring to slacken operations or bank entirely.

Foundry coke has sold in the open market at $15, but two or three important producers refuse to price their coke at above $12, and sell to regular customers what they can spare at not above this figure. There are no negotiations for contract coke, leaving the market quotable at $15 for furnace and $12@$15 for foundry, per net ton at ovens. The *Courier* reports production in the Connellsville and Lower Connellsville region in the week ended May 15 at 154,400 tons.

Estimates of Production

FROM THE WEEKLY REPORT OF THE GEOLOGICAL SURVEY

BITUMINOUS COAL

	1920 Week	1920 Calendar Year to Date	1919(a) Week	1919(a) Calendar Year to Date
May 1b	8,899,000	175,152,000	8,022,000	141,541,000
Daily average	1,483,000	1,679,000	1,337,000	1,357,000
May 8b	9,092,000	184,244,000	8,438,000	149,979,000
Daily average	1,515,000	1,670,000	1,406,000	1,352,000
May 15c	8,773,000	193,017,000	8,436,000	158,415,000
Daily average	1,462,000	1,660,000	1,406,000	1,362,000

ANTHRACITE

	1920 Week	1920 Calendar Year to Date	1919(a) Week	1919(a) Calendar Year to Date
May 1	1,792,000	27,692,000	1,717,000	25,118,000
May 8b	1,840,000	29,531,000	1,782,000	26,900,000
May 15c	1,726,000	31,257,000	1,760,000	28,660,000

BEEHIVE COKE

United States Total

Week Ended May 15 1920c	Week Ended May 8 1920b	Week Ended May 17 1919	1920 to Date	1919 to Date a
348,000	370,000	211,000	8,093,000	7,875,000

(a) Less one day's production during New Year's week to equalize number of days covered for the two years. (b) Revised from last report. (c) Subject to revision. All figures in net tons.

Middle Appalachian

POCAHONTAS AND TUG RIVER

Mines Work 40 Per Cent—Heavy Eastern Demand and Uncertainty of Return of Cars from the West — Customary Coke Output.

During the second week of May the Norfolk & Western car supply was much curtailed due to lack of cars from the West. Under ordinary conditions, the Norfolk & Western supplies all the mines on its lines from Williamson to Wilcoe with empties obtained from the West, other parts of the system being supplied from eastern sources. The car shortage was so acute in certain fields during the last of the week that no mines except those producing railway fuel were able to operate. Even in the Tug River, Pocahontas and Clinch Valley regions cars were insufficient to keep the mines running for more than 40 per cent of the full working time.

Few producers, took advantage of the opportunity to consign coal to the Lakes, because of the heavy Eastern demand, higher prices in the East and the uncertainty as to when the cars used for Lake and Inland West shipments would be returned.

So long as conditions remain subnormal in the West, insofar as the movement of coal is concerned, there is apt to be a continuance of unusually heavy tidewater shipments, from the Tug River field.

Irregularity of operations followed in the wake of a continued shortage of cars in the Pocahontas district in the week ended May 15.

Production was still not over 40 per cent, with the car shortage still in excess of 250,000 tons. The usual amount of coal, however, was coked, amounting to about 13,000 tons. The long haul from tidewater complicated with other troubles made it difficult even to secure cars from the East.

NEW RIVER

Little Improvement in Output — Coal Goes to Tidewater and to Inland East—Small Lake Shipments — Gulf Works Under Half Time.

Though there was still a material shortage of cars in the New River field, during the second week of May, a slight increase in the output of that field was recorded. The production for the entire week was about 110,000 tons. Aside from the larger production on Monday, there was no real improvement in the transportation situation in the New River field.

Since few cars were being received from Western markets, shipments were limited to that part of the country. The bulk of New River production was finding its way to tidewater and to Inland East markets; tidewater points receiving the major portion of the coal which was intended for export and for bunkering purposes. Little coal was being consigned to Inland West markets so the tonnage for the lakes was also small.

The higher scale of prices prevailing at tidewater had something to do with the larger eastern consignments. The heavy movement of both smokeless and high-volatile coal to the East tended to slow up the movement owing to crowded side-tracks between the mines and tidewater. The movement of New River coke to Western markets had grown in volume somewhat and was slowly returning to normal.

Less coal was loaded in the Winding Gulf field during the week ended May 15 than during the previous week; mines on the Virginian Ry., having only a three-day car supply; on the Chesapeake & Ohio, mines operated only two days out of the six.

KANAWHA

Decreased Production Due to Acute Car Shortage—Tonnage Goes to Tide Rather Than West — Price and Movement of Cars Influence Shipments.

Less coal was produced in the Kanawha field, during the period ended May 15, than in the preceding weekly working period, production being limited to about 85,000 tons, or between 40 and 50 per cent of potential capacity.

A most acute shortage of cars was entirely responsible for the greatly curtailed output. The shortage in empties was directly traceable (in part) to the fact that not more than 300 or 350 cars a day from Western lines were being received for distribution by the Chesapeake & Ohio.

Tidewater tonnage preponderated over every other class of shipments from the Kanawha field, tending to cut down the tonnage available for Western shipment due to the difficulty in getting coal through to the West.

LOGAN AND THACKER

Long Eastern Haul and Few Cars from the West, Reduce Output — Logan Works One-Third Time — Logan and Thacker Coal Goes to Tide.

So acute was the car shortage in the Logan field, during the second week of May, that production was reduced to about the level of the last week of April when the full effect of the strike was being felt. The output reached 173,000 tons during the first week of the month, but it dropped to about 133,000 tons during the week ended May 15. For the final week of April, 155,000 tons were produced.

The long haul from Eastern terminals and the meager supply of empties from the West were chiefly responsible for a reduction in the output. Logan mines were only producing at the rate of about 35 per cent of capacity.

Of course with the car supply so greatly restricted, it was difficult to comply with contract requirements for Western consignment; hence sales and shipment of spot coal were almost insignificant, insofar as Western markets were concerned; that being equally true as to Lake shipments.. The greater proportion of the Logan output was finding its way to the seaboard.

While Thacker district mines had managed to speed their output up to 119,000 tons, or about 46 per cent of potential capacity, during the week ended May 8, production fell behind that mark to quite an appreciable extent during the second week of the month, due to a most pronounced shortage of cars. The only mines operating during the last of the week were those holding contracts to furnish railroad fuel.

Cars were scarce, because so little equipment was finding its way to this territory from the West. Virtually the entire output of the Thacker field was being sent to tidewater.

NORTHEAST KENTUCKY

Mines Operate Half Time — Output Largely Under Contract, with Little Spot Coal.

The output for the week ended May 15 slumped from 126,000 to 122,000 tons, car-shortage losses climbed from 143,000 tons to 165,000 tons, an increase of 22,000 tons. Mines were being operated only about half the week.

While there had been a recovery on lines operating in northeast Kentucky, connecting lines were still suffering from the effect of the switchmen's strike. Lake shipments were disappointingly small. There was a heavy demand for byproduct coal.

Fully 80 per cent of the output of the northeast Kentucky field is under contract at figures prevailing more than a month ago; the high prices now being offered for spot coal only applies to a limited portion of the output of the field.

Unless there is a material improvement in transportation conditions, operators in the field are not sanguine that mines generally will be able to work more than 50 per cent of potential capacity for some time to come.

VIRGINIA

Output Decreases as Car Supply Grows Worse—Men Leave for the Farms.

Production in the Virginia fields during the week ended May 15 reached only 101,700 tons, showing a decrease, as compared with the previous week, of nearly two thousand tons, which went to show that the car situation had grown somewhat worse. The poor car supply was responsible for a loss of 68,000 tons, while the loss from a labor shortage amounted to only 9,800 tons. The tidewater movement of coal, after being embargoed for a time, was renewed under permit. At the same time prices on spot coal climbed to $5 a ton with little free coal available to meet the open market demand.

Labor troubles were lacking but few mines, however, had a full complement of men owing to the desertions to the farm for the summer months. Producers found it impossible, owing to limited transportation facilities, to keep pace with the demand.

Middle Western

INDIANA

State Mine Inspector Submits Plan to Governor — Considerable Legislation Proposed.

That a commission be created to codify Indiana mining laws and to have other powers, is proposed in a letter Cairy Littlejohn, state mine inspector, has submitted to Governor Goodrich.

Indiana mining laws are in a disjointed condition, says Mr. Littlejohn, and they should be worked into a harmonious whole. He would have additional legislation covering the use of electricity in mines; providing for the revocation of mine and fire-boss licenses, now held for life; regulations regarding the troublesome washhouse problem and other new legislation to accomplish what many mine inspectors fruitlessly have recommended to legislatures.

Mr. Littlejohn believes the state mine-inspection force should be increased and have a more adequate fund. Also that strip and small mines should be placed under the jurisdiction of the state inspection department.

It is possible that considerable legislation may be proposed regarding coal mining in Indiana. Just now Mr. Littlejohn is said to be having considerable difficulty with some coal and mining companies that are paying little or no attention to providing the inspection department with information it wishes.

SOUTHWEST ILLINOIS

Merger of Standard Field Mines Proposed—About $10,000,000 of New York Capital Involved—Field Supplies Half of St. Louis Fuel.

An effort is being made, it is said, to consolidate under syndicate ownership the 40 coal-mining companies in the Standard field, adjacent to St. Louis (operating 70 mines), with the object of eliminating trade abuses, limiting production and stabilizing prices. The deal is said to be financed by New York interests, and is being promoted by the Stifel-Nicolaus Investment Co. of St. Louis. Options have been obtained on about 40 per cent of the plants in the Standard field, including some of the largest mines in the district, with an output in excess of 50 per cent of the total. Between $8,000,000 and $10,000,000 are involved in the deal. The total production represents between 60,000 and 75,000 tons a day, most of which is marketed in St. Louis.

Elimination of competition in the Standard field, resulting from the merger, would place the entire coal output in the St. Louis district in the hands of a few operators. The Carterville field in southern Illinois is controlled by an association and the Mount Olive field, adjoining the Standard field, is controlled by two or three operators.

The Standard field supplies about half the coal consumed in St. Louis. It is claimed that a consolidation of Standard plants will stabilize the price of coal.

Association Activities

Engineering Advertisers' Association

At the May 11 meeting of the Engineering Advertisers' Association, William Bethke, secretary and editorial director of the La Salle Extension University, and president of the Executives Club of Chicago, addressed the association on the subject, "What Makes Advertising Effective for the Engineering Advertiser?" Mr. Bethke emphasized the importance of making engineering advertising stand on its own merits by giving positive and dependable data regarding the product or service advertised. "Much advertising today," said Mr. Bethke, "has nine strong points and one weak point, and it fails on its weak point. Engineering advertising cannot afford to have a weak point." At this meeting also W. Frank McClure gave a brief history of the National Advertising Commission, of which he is chairman, and explained its functions.

Northern West Virginia Operators' Association

Claiming that northern West Virginia mines supplied by the Pennsylvania, Pittsburgh & Lake Erie, Monongahela and Morgantown & Wheeling railroads are short 16,338 cars for the period between July 1, 1919, and March 1, 1920, George T. Bell (executive vice-president of the Northern West Virginia Operators' Association) recently filed a petition with the Interstate Commerce Commission, praying that a preemptory order be issued by the commission requiring the roads named to furnish the mines on the Monongahela 100 per cent of the orders for cars until the shortage had been overcome. The Commission is also asked to make final award of reparation.

Central Pennsylvania Coal Producers' Association

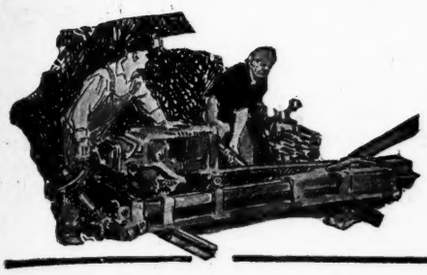
The annual meeting of the Central Pennsylvania Coal Producers' Association was held in Altoona recently, officers for 1920-21 being elected as follows: President, James H. Allport, Barnesboro; vice president, M. J. Bracken, Gallitzin; secretary-treasurer, Charles O'Neil, Altoona; statistician, W. A. Jones, Altoona; counsel, J. E. Evans, Ebensburg. Announcement was made of the withdrawal of the Berwind-White and several companies in the Buffalo, Rochester & Pittsburgh R. R. district, following the Central Pennsylvania Association consolidating with the Association of Bituminous Operators. Harry Boulton, of Clearfield, is the retiring president. The mines of the association produced 45,970,156 tons of coal last year.

Report of Operating Conditions at Coal Mines in Indiana, April, 1920

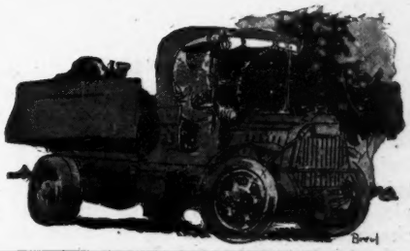
PREPARED BY JONAS WAFFLE, SECRETARY INDIANA COAL TRADE BUREAU.

Railroads on which Mines are Located	District	No. of Mines	Tons Produced	Full Time Capacity (Tons)	Tons Lost and Causes Therefor — Total all Causes	Car Shortage	Labor Trouble	Mine Disability
Big Four	Terre Haute	6	57,881	170,471	112,590	96,920	14,720	950
B. & O. S. W.	Vincennes	2	26,146	43,319	17,173	16,735	438	.....
	Clinton	26	288,871	410,196	181,325	157,255	16,560	7,510
C. & E. I.	(1) Sullivan	17	137,619	289,882	152,263	138,418	10,332	3,513
	Total	43	426,490	760,078	333,588	295,673	26,892	11,023
C. I. & W.	Dana	1	7,734	7,934	200	200	.....	.....
Central Indiana	Brazil	1	4,550	4,750	200	.....	200	.....
	Clinton	10	72,461	237,699	165,238	157,838	6,200	1,200
C. T. H. & S. E.	Linton	25	111,564	341,829	230,265	222,843	6,740	1,182
	Total	35	184,025	579,528	395,503	380,181	12,940	2,382
E. & I.	Clay City—Petersburg	10	75,239	185,531	110,292	97,171	7,599	5,522
E. & E.	Evansville	2	7,087	9,899	2,812	1,430	498	884
E. S. & N.	Evansville	4	17,181	29,759	12,578	7,694	4,683	201
Illinois Central	Linton	6	44,657	84,423	39,766	35,005	2,839	1,922
Monon	Linton	20	154,219	316,629	162,410	112,260	24,600	25,550
	(2) Main Line	20	113,982	357,586	243,604	216,114	9,830	17,660
P. C. C. & St. L.	(3) Vincennes	21	282,672	732,617	449,945	388,990	28,800	32,155
	Total	41	396,654	1,090,203	693,549	605,104	38,630	49,815
	Ayrshire	9	31,222	110,078	78,856	68,339	6,581	3,936
Southern	Boonville	9	33,112	127,824	94,712	85,389	5,642	3,681
	Total	18	64,334	237,902	173,568	153,728	12,223	7,617
Totals		189	1,466,197	3,520,426	2,054,229	1,802,101	146,262	105,866

(1) Includes all mines South of Terra Haute.
(2) Includes all mines on St. Louis and Michigan Divisions.
(3) Includes all mines on Vincennes Divisions and Dugger Branch.



Mine and Company News



GEORGIA

Savannah—The Taggart Coal Co. is having plans prepared for the construction of a large new coaling dock on its river front property recently acquired under lease. The proposed new dock will have a frontage on the river of about 750 ft., a depth of 600 ft., and be 65 ft. in height, arranged to accommodate two steamers, and will have a bunkering capacity of about 1,200 tons per hour. Complete coal-handling machinery will be installed, to be electrically-operated.

ILLINOIS

West Frankfort—A fire, starting from an oil explosion, damaged mine No. 18, controlled by the Peabody Coal Co., of Chicago, to the extent of $150,000, on the night of May 12.

KENTUCKY

Lexington—The following Kentucky coal companies have increased their capital stock recently:

The Standard Elkhorn Coal Co., of Garrett, increased from $50,000 to $200,000; the Defiance Coal Mining Co., of Lexington, from $100,000 to $200,000; the High Splint Coal Co., of Williamsburg, from $400,000 to $600,000.

Louisville—A recent report from Jellico, Tenn., was to the effect that the Consolidated Fuel Co. had purchased the properties of the Smoot Creek Coal & Coke Co., Jellico (Charles P. Price, principal owner), at a cost running into seven figures. The same interests recently purchased the West Virginia & Kentucky Coal Co. properties. It is planned to improve the Smoot Creek properties, installing electrical equipment throughout.

MONTANA

Belt—An order has been placed by the Merkle Coal Co., of this place for machinery and equipment for the tipple of the Merkle mine from Chicago. Plans for the installation of the machinery were drawn up by R. R. Vaill, the company engineer, who recently made a survey of the ground. The shipment will include modern bar screens, crushers, and picking tables. A three-ton weighing pan will also be installed for convenience in coaling Great Northern locomotives.

When this equipment has been installed, the plant will probably be one of the best equipped coal mines in the state. The coal will be prepared more economically and the quality of the fuel will be much improved; it can be utilized for commercial and domestic trade.

NORTH DAKOTA

New Salem—Government aid having been given the development of the lignite coal industry in North Dakota, its promoters declare it will become the most important coal industry in the Northwest. A model briquetting plant is to be erected at New Salem by the Government, with an appropriation of $100,000 for the erection of the plant and experimental work. By the process of carbonizing the lignite perfected in the U. S. Bureau of Mines, a lignite briquet will be manufactured to compete with high-grade anthracite.

OHIO

Columbus—The Panhandle Collieries Co. has increased its capital from $125,000 to $250,000 in order to provide additional capital for the development of the property of the company on the Pennsylvania R. R. in Jefferson County. The company is a subsidiary of the Hisylvania Coal Co., of Columbus, and J. W. Blower is at the head.

PENNSYLVANIA

Johnstown—Two thousand acres of coal land along the Potomac, in West Virginia, have been purchased by the A. B. Crichton Coal Co., of Johnstown, for $500,000. The plant is on the Western Maryland R. R., near Vindex, Md., extending to the West Virginia border. The output is 700 tons daily. The new owners will operate the plant under the name of the Manor Coal Co., with the following officers: President, A. B. Crichton; treasurer, John M. Crichton; secretary and general manager, H. A. Crichton, all of Johnstown.

Wilkes-Barre—The Laflin breaker, one of the largest plants of the Hudson Coal Co., located at Laflin near Wilkes-Barre, was entirely destroyed by fire recently. The total loss will amount to approximately $300,000 and will cause more than 500 men to be temporarily out of work.

The fire had gained such headway near the top of the breaker that the fire fighting organizations from nearby towns accomplished little except saving other buildings. Traffic on the Delaware & Hudson and Central railroads was delayed for a time.

An investigation was started by officials of the company who declare there was no one in the plant after 6 o'clock at night. Charles Dorrance, general manager of the company, intimated that the breaker will not likely be rebuilt. Coal from this mine will be sent to the Baltimore colliery for preparation.

The breaker was of wood construction and built nearly 26 years ago. Recently it had been modernized by the installation of 12 new jigs and other repairs at a cost of more than $60,000. It had a daily capacity of 2,500 tons and was insured for about $100,000.

Washington—John A. Bell of Carnegie, Pa., owner and developer of extensive coal acreages in northwestern and western Washington County, recently purchased the interest of Cyrus Ferguson, in the Cedar Grove mine of the Verner Coal Co. in the Avella district, northwest of this place. The reported price in the transaction is $600,000. It is one of the largest workings in the Avella district, and the acreage to be developed through it totals close to 1,000.

An important development in connection with mining in the Avella district is the completion of a survey by the West Penn Power Co., for the purpose of installing a high-tension line through that section. It is understood that it will be run from the Beach Bottom power house and that current will be furnished to mines throughout northwestern Washington County.

Whitesburg—The Consolidated Fuel Co., of Pittsburg, Pa., which recently purchased the mines of the West Virginia & Kentucky Coal Co., has just purchased the property and mines of the Smoot Creek Coal & Coke Co., of Jellico, Tenn. The properties are owned by Charles P. Price and the consideration is said to have been $70,000,000.

The purchaser will install electric mining machinery and electrify the mines, including the installation of electric lights in all employees' homes. E. Stewart arrived here recently to arrange for the building of 100 homes for the employees.

Greensburg — The Humphrey Coke plant, in the old Connellsville basin, near here, has been purchased from the J. H. Hillman & Sons interests by the American Radiator Co. The Humphrey Coal & Coke Co. has been organized as a subsidiary by the American company, the president being A. A. Landon; the vice president, E. F. Fitch; the secretary, W. D. Freyburger; the treasurer, W. H. Hill, the first two being of Buffalo and the other two of Chicago. A. B. Kelley, of Greensburg, will be assistant treasurer and general manager.

Lynchburg—The Ivy White Ash Coal Co. has increased its capitalization from $150,000 to $300,000, to provide for general business expansion. F. E. Turner, Jr., is secretary.

WEST VIRGINIA

Williamson—It is understood that the Pond Creek Coal Co. and the Williamson Coal Co., in which Captain E. L. Bailey, of Bluefield, was largely interested, have been sold to Charleston people, though whom the purchaser or purchasers were has not so far been developed, but it is stated that the sum paid for Captain Bailey's holdings in the two concerns named was more than $1,000,000.

Morgantown—The sum of approximately $200,000 was involved in the purchase of about 750 acres of Pittsburgh and Sewickley coal on Indian Creek, Monongalia County, W. Va. (near Arnettsville), by the Whyel Coke Co.

Beckley—Operations on a large scale in Shady Spring district of Raleigh County, W. Va., are to be undertaken by the Welton Smokeless Coal Co., organized by men identified with the production of smokeless coal. The new company has a capital of $350,000. Prominently identified with the new company are: J. B. Clifton, C. H. Meador, F. L. Conway, and Ashton File, all of Beckley; J. W. Wilson, of Wyco, W. Va.

A majority interest in the Bacontown Coal Co. and in the High Knob Coal Co. has been acquired by John W. Wilson, of Wyco, W. Va., and J. B. Clifton, of Beckley, the interest of C. M. Lilly and others having been purchased. The two companies, adjoining each other, will be reorganized and operated under the name of the Welton Smokeless Coal Co. The purchase of the two concerns and their consolidation under one management, is regarded as one of the important events of the year in the Winding Gulf field, where the two properties are located.

John W. Wilson, of Wyco, and J. B. Clifton, of Beckley, recently acquired control of the coal properties of the Bacontown Coal Co., and the High Knob Coal Co., both in the Widing Gulf field, purchasing a majority of the stock from C. M. Lilly and associates. A more rapid development of the properties may be looked for.

Bluefield—At an estimated cost of $4,000,000, a branch line of the Norfolk & Western (18 miles in length) will be constructed from Lenore, W. Va., along Rockhouse Fork of Pigeon Creek, in Mingo County, opening up about 25,000 acres of coal land for development. While negotiations for the construction of the branch line have been pending for a month or more, it was not until the last of April that negotiations between the United Thacker Coal Co. and the Norfolk & Western were completed. The acreage to be made accessible carries the Thacker, Winifrede, Chilton and Coalburg seams of coal. It is hoped to have the new branch line in operation by July 1, 1921.

It is believed that development work on coal and timber properties on the new branch line will involve an expenditure of about $2,000,000. The United Thacker company has leased large acreages to A. B. Rown, general manager of the Solvay Collieries Co.; to Garner Fletcher, of the Elkhorn Piney Coal Mining Co.; to George S. Wallace, president of the Union Bank & Trust Co. and to H. H. Morris, president of the Standard West Virginia Coal Co.

CANADA

Montreal.—The consolidation of nine steel, coal and transportation companies of Canada into the British Steel Corporation, with a capital of $500,000,000, was announced recently by Colonel Grant Morden. He said it was the largest merger of its kind in the British empire and second only to the United States Steel Corporation.

Colonel Morden declared the consolidation will associate the iron and coal deposits of the Atlantic seaboard of the Dominion with the steel making experiences and financial resources of Great Britain.

Included in the consolidation are:

Dominion Steel Corporation and its subsidiaries; Nova Scotia Coal Co., Ltd., and its subsidiaries; Canada Steamship Lines, Ltd., and its subsidiaries; Canada Foundaries and Forgings, Ltd., and its subsidiaries; Maritime Nail Co. and its subsidiaries; Collingswood Shipbuilding Co., Ltd.; Port Arthur Shipbuilding Co., Ltd.; Halifax Ship Yards, Ltd., and Davie Shipbuilding and Repairing Co., Ltd. Negotiations are in progress with several other enterprises to enter the consolidation, according to Colonel Morden.

Industrial News

Cincinnati, Ohio—The owners of the J. M. Macdonald Coal Mining Co., who had leased their three mines at Rosebud, Harrison County, W. Va., took back these properties on April 1 and will operate these mines themselves. The properties are on the Baltimore & Ohio R.R.; the mine office is at Rosebud and the main office is in the Union Central Bldg., Cincinnati, Ohio.

Philadelphia, Pa.—Members of the Motive Power Battery Sales Department of The Electric Storage Battery Co. of Philadelphia, gathered recently in this place, for their first annual convention. Sixty men were present from points as far west as Denver, as far south as Atlanta and on the north from Canada. The sessions were given over to a close study and review of the storage battery possibilities in connection with the propulsion of electric street trucks, electric industrial trucks and electric mine locomotives. The convention was held in the Green Room of the Bellevue-Stratford Hotel, April 29, 30 May 1.

Personals

L. W. Fogg, general manager of the Tower Hill Connellsville Coke Co., has been retained temporarily by the new owners, the Hillman interests. Mr. Fogg is essentially a builder of coke plants, and when the new owners of Tower Hill complete the reorganization, it is understood he will resume his chosen profession as construction engineer.

Mr. Fogg came to the Connellsville region in 1899 as an engineer for the American Steel & Wire Co. to report on the property now developed as the Leckrone, Footedale and Buffington plants of the H. C. Frick Coke Co.

Mr. Fogg was construction engineer for the American Steel & Wire Co., built the Edenborn, Gates and Lambert plants in 1900 and the following year was made general superintendent of operations. In 1903, after the absorption of those plants by the H. C. Frick Coke Co., he became division engineer for the mines south of Connellsville.

In 1904 he commenced the construction of the Brier Hill Coke Co. plant. He became general manager of the Tower Hill copany in 1907, building the present two plants.

Coming Meetings

West Virginia Coal Mining Institute will hold its annual meeting June 7 and 8, at White Sulphur Springs, W. Va. Secretary, R. E. Sherwood, Charleston, W. Va.

American Wholesale Coal Association will hold its annual meeting June 1 and 2, at Pittsburgh, Pa. Secretary, G. H. Merryweather, Washington, D. C.

The Colorado Retail Coal Dealers' Association will hold its annual meeting June 8, at Colorado Springs, Col. Secretary, E. Hopper, Denver, Col.

Southwestern Interstate Coal Operators Association will hold its annual meeting June 8 at Kansas City, Mo. Secretary, A. L. Johnson, Kansas City, Mo.

National Conference of Business Paper Editors will hold its next meeting June 4 at the Congress Hotel, Chicago, Ill. Secretary, R. Dawson Hall, 36th St. and 10th Ave., New York City.

American Institute of Mining & Metallurgical Engineers will hold its fall meeting about Aug. 20. It is proposed to leave Buffalo by steamer and cruise through the Lakes, the first stop being at Houghton, Mich., after which the party will visit Duluth and the Iron Ranges of Minnesota. Secretary, Bradley Stoughton, 29 West 39th St., New York City.

Mine Inspectors' Institute of America will hold its annual meeting July 13, 14 and 15 at Cleveland, Ohio. Secretary, J. W. Paul, Pittsburgh, Pa.

Pennsylvania Retail Coal Merchants Association will hold its annual meeting June 23, 24 and 25 at Reading, Pa. Secretary, W. M. Bertolet, Reading, Pa.

The Rocky Mountain Coal Mining Institute will hold its annual meeting in Denver, Col., in conjunction with the National First Aid Meet on Aug. 20 and 21. Secretary, F. W. Whiteside, Denver, Col.

M. O. I. Coal Association will hold its annual convention June 16, 17 and 18 at Cedar Point, Ohio. Secretary, B. F. Nigh, Columbus, Ohio.

National Retail Coal Merchants' Association will hold its annual meeting June 10-12, Detroit, Mich. Secretary-manager, Ellery Gordon, Philadelphia, Pa.

Kentucky Mining Institute will hold its annual meeting June 4 and 5 at Lexington, Ky. Secretary, C. W. Strickland, Huntington, W. Va.

Obituary

George A. Strebel, of Springfield, Ill., for many years superintendent for various mines in the Belleville district, Illinois and well known among Central Illinois coal leaders, died recently at his home as a result of a paralytic stroke. He was, at the time of his death, inspector for the Mine Operators' Indemnity Exchange of Illinois. He was sixty-six years of age and was born in Switzerland.

John Franklin Kiser, a well known coal man of central Ohio, died at a local hospital recently from a carbuncle. He has been connected with a number of operating concerns, the last being the western office of the Elk River Coal & Lumber Co. He leaves a brother and a sister. He was 60 years of age, most of which was spent in Columbus. The funeral and burial took place at West Liberty, Ohio, his former home.

Edward Devoy, age 73 years, one of the most prominent and best known retail coal men in the middle west, died suddenly of heart failure at his home in St. Louis on May 10. For over 40 years he was engaged in the retailing and wholesaling of coal in St. Louis—formerly with Devoy & Kuhn Coal & Coke Co., and for the last six or seven years as president of the Edward Devoy Fuel Co.